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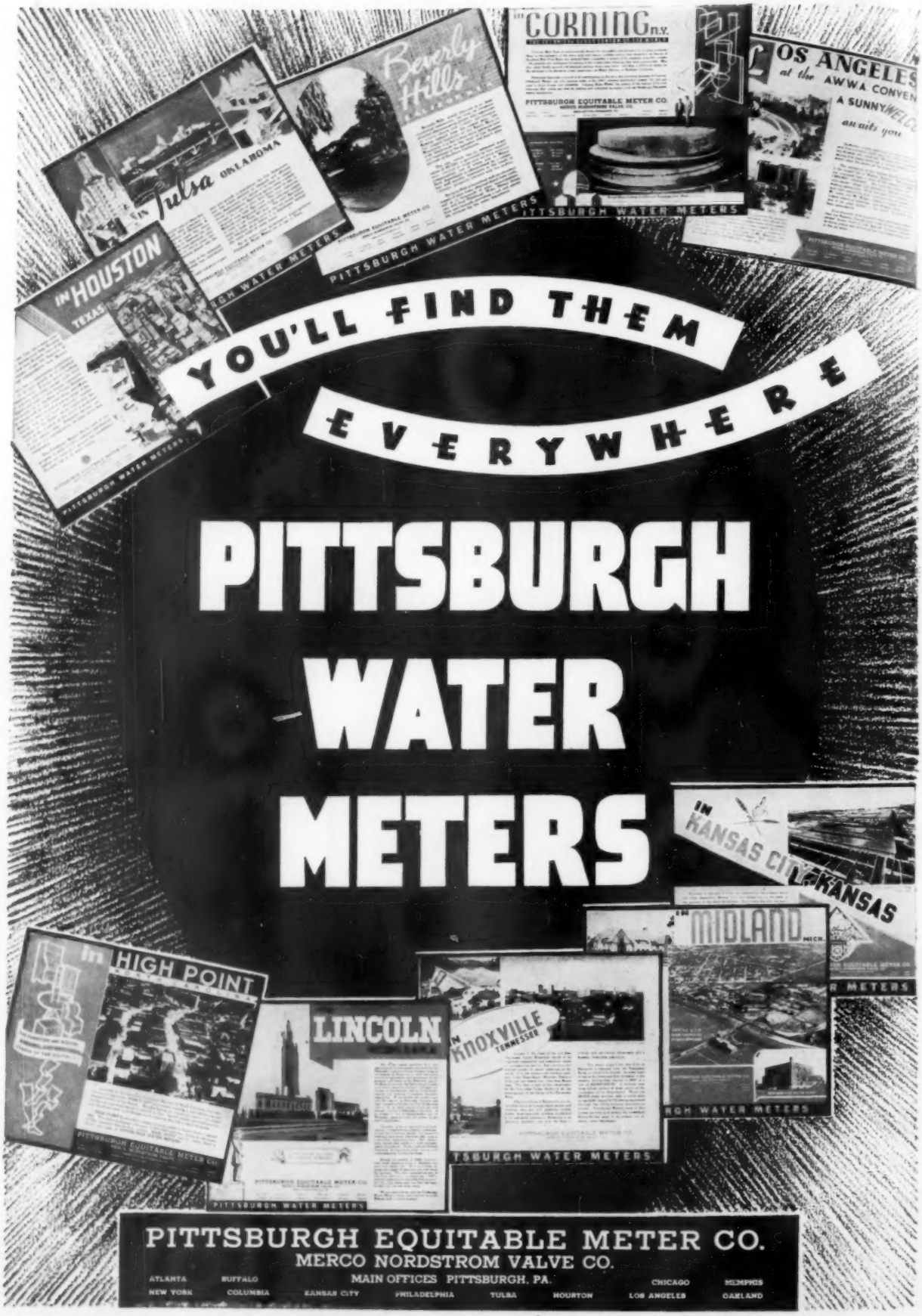


Do you mention THE AMERICAN CITY? Please do.

State and Local Election Results

Taxation

DEFEAT of proposed constitutional amendments for tax limitation in Colorado, Georgia and Oregon, of a Michigan proposal to abolish the property tax entirely, and of a Minnesota proposal to restrict property taxation to local governments, were among the outstanding election results of last month in the field of public finance. The subject of taxation received attention in 13 states. In Nevada a 50-mill tax limitation was adopted for the first time, and in Washington voters decided to continue the present 40-mill tax limit for another two years. In California a measure was passed which supposedly clarifies and adds to the definition of unsecured property for taxing purposes. Assessments upon possession of, claim to, or right to the possession of land and upon taxable improvements located upon land exempt from taxation, which are not a lien upon land sufficient in value to secure their payment, and upon oil and mining rights, were added to the classes of property to be taxed. Two defeated measures in California are of interest. The famous Personal Income Tax Act of 1935 was submitted to the voters by an initiative petition, but its repeal was not secured. A defeated measure which has caused considerable country-wide discussion proposed a punitive tax on chain stores up to $500 per unit for concerns with ten or more establishments.

There are two notable attempts to exempt food purchased for home consumption from sales taxes. The results were opposite, Ohio favoring the idea, while Michigan did not. North Carolina accepted all amendments appearing on the ballot, and as a result she is in for an increase in the public debt, tax exemption for homes worth less than $1,000, and a rise in income levies to 10 per cent. Several other states are likewise due for an increase in debt, notably New York and Louisiana, each with a $30,000,000 issue. Utah and Arkansas ratified proposals for tax exemption of homesteads to a limited extent.

Colorado is catching the automobile property-tax dodgers. A new constitutional amendment directs the General Assembly to exempt motor vehicles, trailers, and semi-trailers from the general property tax and to substitute a "graduated annual specific ownership tax" payable simultaneously with the purchase of a state license. An interesting measure, defeated in Portland, Ore., would have provided for the year 1937 a tax of 1 mill on each dollar of property valuation, to create a fund for the express purpose of city purchase of certain industrial sites.

Civil Service

IN addition to these tax measures, many proposals covering a variety of other subjects were submitted to popular vote. Civil service received attention in six cities, one county, and two states. Muskegon, Mich., electors voted to place nearly all municipal employees under a civil service system. Two other Michigan cities—Adrian and Ypsilanti—voted to hire firemen by civil service. Dearborn voted to consolidate its two civil service commissions into one commission. The city of Rahway, N. J., and Camden County, N. J., voted to come under the New Jersey state civil service law, which means that in the future all their employees will be examined and approved by the State Civil Service Commission. Astoria, Ore., favored selection of firemen by civil service.

New York City's New Charter

LOCAL government changes of special significance were approved by the voters of the city of New York. Here a new charter was adopted and Proportional Representation received the sanction of the people. The principal controversial issue of the charter was its provision for a City Planning Commission of seven members, one the Chief Engineer of the Board of Estimate and the other six to be appointed by the Mayor. The Planning Commission will have the task of preparing a master plan for the city, and if at any time the Board of Estimate desires to change some feature of the plan above the head of the Commission, it must have a three-fourths vote to do so. The Commission is also in charge of zoning matters and plays an important part in the capital outay budget, being called upon to submit a five-year program as well as one for the ensuing year.

The Proportional Representation system assures a greater minority representation among the city councilmen and is considered a threat to machine rule, with a particular blow to the prestige of the Tammany organization in the city.

Social Security

SOCIAL security was a live popular issue this November. Colorado, Florida, Kansas, Louisiana, and South Carolina voted changes which enabled their states to participate in the Federal social security program. All five were concerned with old-age assistance. Kansas, in addition, considered and approved an amendment dealing with unemployment compensation. Louisiana included mothers' and children's aid and welfare, unemployment compensation, and assistance to the blind in her proposal. South Carolina's amendment gave the Legislature power to enact social security legislation. The Colorado amendment reduced the minimum age limit for old-age assistance eligibility from 65 to 60, five years below the Federal requirements. In this state an old-age pension is considered a right as well as a need. A grant of $45 per month to recipients is provided, of which $15 is reimbursable by the Federal Government.

In addition to the above-mentioned five states, Missouri voted old-age pensions to firemen and school teachers. Nevada, Oregon and Washington voted on the question of social security with unfavorable results.

Miscellaneous

A FEW miscellaneous measures deserve attention also. New York City passed on a plan securing the three-platoon system with an eight-hour day for firemen. Chicagoans voted overwhelmingly for a return to central standard time. Most Florida counties condemned slot machines. The state of Arkansas simplified its court procedure. Finally, liquor measures were widespread, Oklahoma remaining dry, two Oregon towns ousting package sales, North Dakota permitting the sale of liquor for the first time in its statehood, Texas defeating state liquor control, and California rejecting state control and a local option scheme.

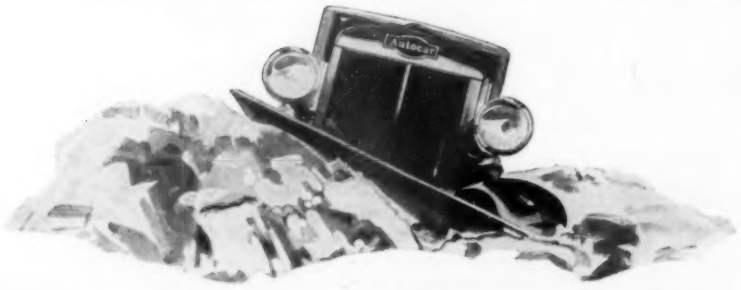
Among other administrative measures approved were a constitutional amendment in California under which it will be possible by local referendum to consolidate city and county governments; and a Florida amendment to permit city-county consolidation in Key West.

Where "P. R." Is Used

With the city of New York now added to the growing list of municipalities whose charters provide for the Proportional Representation method of election, the following paragraph from a recent leaflet of the Proportional Representation Campaign Committee, of New York, is of more than local interest:

"P. R. is used in Cincinnati, Toledo, Hamilton, Wheeling, Winnipeg, Calgary, Dublin, Cork and other well-governed cities for city councils; in the Irish Free State for all elections; in nearly every part of the English-speaking world for some important elections. Other forms of Proportional Representation, which give parties their fair share but lack some of the other advantages of the plan proposed here, are in use for practically all elections in Norway, Sweden, Denmark, Finland, Czechoslovakia, the Netherlands, Belgium and Switzerland."

Clear Highways as Wisconsin does with Four-Wheel-Drive AUTOCARS



In the record-breaking cold of last winter, Four-Wheel-Drive Autocars proved their snow-moving superiority to both Racine County and Kenosha County maintenance men. Not only in Wisconsin, but in the northern-tier states clear to Maine, Autocars delivered more miles of snow-cleared roads through worse drifts than had ever before been expected of a motor truck.

Traction is the reason. Traction, power, and sturdy strength. Massive bolted frames as deep as 10½". Giant silico-manganese springs that laugh at the impact of hard-packed drifts. Power up to 123 horsepower. And a transmission system that delivers to *every* wheel all the power it can turn into resistless forward motion. This *positive* drive, with each axle working independently of the other makes Autocars simply walk through drifts.

In driver comfort, safety from monoxide, 24-hour-a-day performance, and final economy, Autocar 4-wheel-drives are the world's finest snow pushers. America's snow-belt states use them regularly.

"Follow the Leaders for They Know the Way"

Autocar Trucks

The Autocar Company, Ardmore, Pa. ★ *Factory Branch Service in Leading Cities*

During December we hope you will remember to mention THE AMERICAN CITY

Streets and Roads - Grade Crossings

OPERATING A CRANE WITH LOW HEADROOM IN REMOVING STREET-CAR RAILS IN SAN FRANCISCO

Speedy Track Repairs

WHEN the Municipal Railway of San Francisco replaced the old street-car rails on Union Street, Farnsworth and Ruggles, local contractors, used a small P & H Bantam Weight truck-mounted crane to handle the job. The short boom of the machine made it possible to work rapidly under the trolley wires, and in less than half a day to remove an entire block of rails. Former methods used to take 2½ days for the same distance. This quick performance materially shortened the time this section of line was out of service.

Concrete Guesswork Cut

A NEW method to determine the amount of "free" water and "absorbed" water in sand used in a concrete mixture has been developed by the U. S. Bureau of Public Roads. Employing this test, which requires only the use of a small cone lightly tamped with sand, it is easy to produce a condition in which the pore spaces in the sand grains are completely filled with water without any free water adhering to the surfaces of the particles. The moisture present when the sand is in this condition is called the "absorbed" moisture. Any excess over this amount is called "free" moisture. Bureau engineers point out that the test makes possible a much simpler and more accurate method of making allowance in the water added to a batch of concrete for variations in free moisture in the sand. The test is useful both in the laboratory and in field control of concrete mixtures.

It is the so-called free moisture in concrete mixtures that dilutes and weakens the cement paste. Only a small part of the water used in mixing concrete is needed for complete hydration of the cement. The rest of the water lubricates the mix so that it may be placed uniformly and without difficulty. Free moisture in sand in unknown quantity upsets the scientific proportioning of concrete.

The test was developed by D. O. Woolf, Associate Materials Engineer in the Bureau of Public Roads. Moist sand containing free water can be shaped into molds by light pressure. Dry sand cannot be molded. After experimenting with cones of many shapes, Mr. Woolf found that sand lightly tamped into an inverted cone with a top diameter of 1½ inches and a bottom diameter of 3½ inches contains free moisture if it holds its shape when the cone is removed. At the point where the sand slumps upon removal of the cone, free moisture is gone.

Many methods of determining when sand is surface-dry have been suggested, but extensive study by the Bureau has shown that most of these methods are likely to be either inaccurate or so delicate that their use in routine testing is now warranted. The cone test has been adopted by the American Association of State Highway Officials.

Grade Crossings Being Removed at Rapid Rate

ELIMINATION of railroad grade-crossing hazards at an unprecedented rate has been made possible by the allocation last year of $200,000,000 of emergency relief funds for that purpose, according to the U. S. Bureau of Public Roads. With these funds, 2,097 existing grade crossings will be eliminated, 320 old grade-separating bridges will be rebuilt, and 1,037 crossings will be protected by the installation of safety gates, flashing signals, or other warning and safety devices. Of the 2,097 grade crossings to be eliminated, 1,579 will be done away with by the construction of bridges to carry the highways under or over the railroads, and the remaining 518 will be avoided by relocation of the highways.

In addition to the structures mentioned above, nine grade-separation structures will be built with emergency relief funds allocated for highway construction, and 728 structures will be built this year with other Federal funds appropriated since 1933 and smaller previous programs.

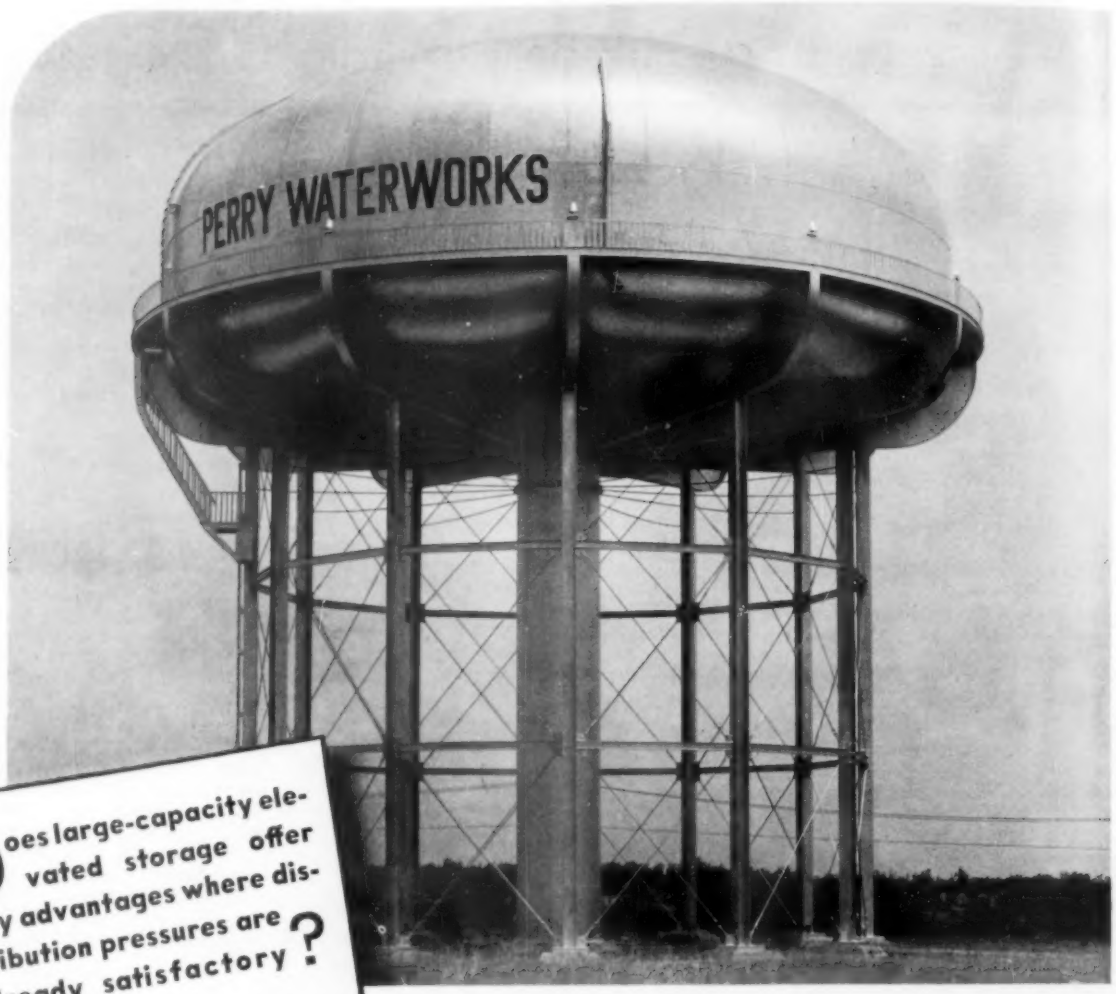
The Bureau reports that 281 of the structures and 136 of highway relocation projects provided for in the last year's program were completed on October 1, and the installation of protective devices had been completed at 29 of the planned locations. The total cost of the complete work was $18,203,462.

All states and practically all railroad companies have benefited by the safety-promoting work made possible by the grade-crossing allocation of relief funds. The Bureau reports that these grade-crossing projects have furnished direct employment in recent months to an average of 40,000 men, and that indirect employment in the production and transportation of materials and equipment was given to an additional 68,000 men.

Rough Work for Pleasure Road

THE CITY OF DENVER, COLO., BUILT 13 MILES OF PASSABLE AUTOMOBILE ROAD THROUGH PRIMITIVE COUNTRY IN TWO MONTHS LAST SUMMER WITH THIS OUTFIT

The Caterpillar RD7 with a LeTourneau Angledozer averaged ¼- to ½-mile of road a day through the 35-foot pine trees on Jones Pass over the Continental Divide near Denver



Does large-capacity elevated storage offer any advantages where distribution pressures are already satisfactory?

—Perry, N. Y., says "Yes!"

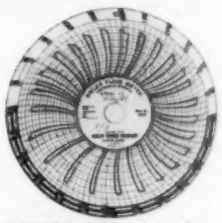
In Perry, N. Y., users of water have seldom had any complaint to make about low pressure. In the business district, pressure rarely varied more than a few pounds in any day. Under such circumstances, you may wonder why the waterworks department decided to put in the 750,000-gal. radial-cone bottom tank shown above.

Explanation lies in the fact that Perry was definitely in need of greater reserve for protection against fire, than was provided by the existing 100,000-gal. standpipe. Careful investigation of cost and merit of means available for providing this reserve resulted in the selection of large-capacity elevated storage as the solution for the problem.

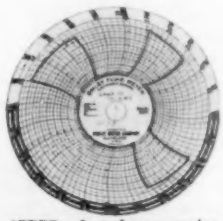
With the tank installed, other benefits immediately became evident. Where pumps had formerly cut in twenty-five times in twenty-four hours with a total running time of 8 hrs., 45 min., they now cut in only three times a day and with a total running time of only 7 hrs., 5 min. This gives the personnel more time for other duties and greatly reduces the wear and tear on starting boxes, compensators, motors, pumps, etc., as well as actually reducing power costs.

• • • •

Let us give you the facts about the improvements in service and reductions in pumping costs that can be secured with properly-designed elevated storage. Write our nearest office for estimating data.



BEFORE—This chart shows how pumps started and stopped twenty-five times or more a day.



AFTER—Just three pumping periods in 24 hours. With little difficulty, this can be concentrated at times when lowest power rates prevail.

CHICAGO BRIDGE & IRON COMPANY

Chicago	2127 Old Colony Bldg.	Philadelphia	1616 "1700" Walnut St. Bldg.	San Francisco	1033 Rialto Bldg.
New York	3308-165 Broadway Bldg.	Boston	1501 Consolidated Gas Bldg.	Houston	2919 Main Street
Cleveland	2236 Rockefeller Bldg.	Birmingham	1502 N. Fiftieth Street	Tulsa	1625 Thompson Bldg.
Detroit	1501 Lafayette Bldg.	Dallas	1406 Dallas Athletic Club Bldg.	Los Angeles	1403 Wm. Fox Bldg.

Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Water Supply — Meters — Problems

New 12-Year Construction Program for New York's Delaware Water Supply

THE new $275,000,000 project for a new water supply for New York City from the Delaware River, involving the construction of a 115-mile aqueduct, is actually under way. Bids were opened in April, 1936, and exploratory borings started in May. This project has been advocated for 20 years and is now following plans prepared in 1927 at the direction of Thaddeus Merriman, former Chief Engineer, Board of Water Supply.

The work will require twelve years of construction, although water will begin flowing through the tunnels within seven years. The water which may be drawn from this supply is limited by a United States Supreme Court decision of May, 1931, to 440,000,000 gallons per day. This amount is assured by the construction of the East Branch, Neversink and Rondout reservoirs. The three other projected reservoirs, Little Delaware, Beaver Kill and Willowemoc, which would have supplied an additional 160,000,000 gallons a day, have been ruled out until such time as the city again applies for permission to construct them. Four villages and several hamlets will go out of existence, owing to the construction of the reservoirs.

Water will flow to New York City entirely by gravity, and not a single pumping station will be needed. Thus, the new supply will be similar to that of the Schoharie and Esopus watersheds. The surface elevation at East Branch reservoir will be 1,250 feet, from which the water will drop 410 feet to Rondout reservoir. Then by steps it will drop to a low point of 600 feet below sea level under the Hudson River and rise 1,100 feet or more to the level of the West Branch reservoir in the Croton reservoir. The flow from this point will be to Hill View reservoir in Yonkers, where the Delaware water will mingle with Ashokan and Schoharie water at an elevation of 295 feet. The water is delivered through No. 1 and No. 2 tunnels to all the boroughs comprising New York City, except Richmond and Long Island.

The Record of Frozen Meters in Chicago in 1936

DURING the first three months of 1936 in Chicago, it was necessary to remove approximately 3,200 meters from service because of freezing. During 1933 there were only 897 meters frozen, in 1934 there were 424 frozen, and in 1935 there were 770 frozen. The 3-, 4- and 6-inch meters with cast iron casings, when frozen solid, invariably cracked. Measuring chambers were also sprung. In a great many cases, however, it was possible to put them in shape again. With others, when too badly damaged, the parts that were not affected were salvaged.

The meters of 3-inch size and over, frozen during the winter, were those installed in meter vaults in the emergency services and were kept shut off. As a rule, the large meters in meter vaults will not freeze, but, 1936 being an exception as the frost went down over 5 feet, the freezing is accounted for. Many meters located in meter vaults were frozen, which in past winters had given no trouble. This was caused by the fact that the frost penetrated below the bottom of the meter vault and therefore there was nothing to keep the vault heated. This was evident in basins where the hoar frost extended to the bottom of the basin.

—From a paper by LORAN D. GAYTON, Acting City Engineer, Chicago, Ill., presented before the Illinois Section, American Water Works Association.

Quarter-Turn Belt Drive for Deep-Well Pumps

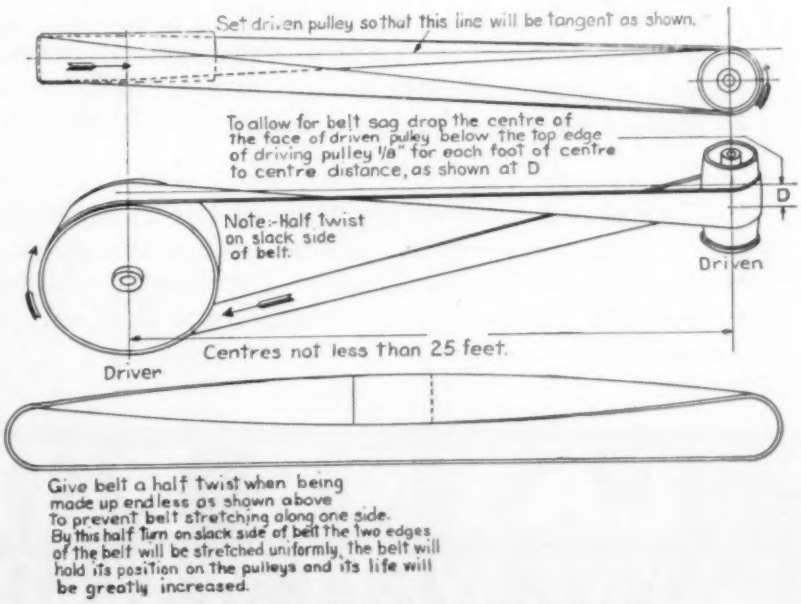
THE accompanying sketch shows two worth-while kinks that are employed and recommended by a prominent builder of deep-well pumps. Their adoption will prove useful to water-works men who may some day find themselves confronted by the problem of connecting shafts that are at right angles with each other. In other words, the kinks pertain to "quarter-turn belt drives."

In this particular instance we have a large pulley on a horizontal shaft, and a smaller pulley on a vertical shaft. The relative positions are clearly shown, and, as specified, the shaft centers should not be less than 25 feet. In fact, the distance should be greater than 25 feet if the ratio of the pump and driver speeds is very large.

The most interesting and valuable feature is the "half-twist" given to the slack side of the belt. By giving the belt a half-twist, as shown, the belt will naturally stretch uniformly on both edges and it will be more apt to perform satisfactorily than would be the case if it is not given the half-twist. Without such a twist, all of the stretch will be along one edge, and when that stretch becomes permament, as it usually does, belt trouble is likely to develop.

The other kink is the vertical pulley adjustment recommended for taking care of belt sag, namely, ⅛-inch per foot of center to center distance between shafts.

W. F. SCHAPHORST.


Set driven pulley so that this line will be tangent as shown.
To allow for belt sag drop the centre of the face of driven pulley below the top edge of driving pulley 1/8" for each foot of centre to centre distance, as shown at D
D
Note:-Half twist on slack side of belt.
Driven
Centres not less than 25 feet.
Driver
Give belt a half twist when being made up endless as shown above To prevent belt stretching along one side. By this half turn on slack side of belt the two edges of the belt will be stretched uniformly, the belt will hold its position on the pulleys and its life will be greatly increased.

NEW WAYS OF IMPROVING BELT LIFE AND POWER

"Old Mill Stream" Dirty

UNDER this identical title the New York *World-Telegram* recently printed an Associated Press dispatch from Findlay, Ohio, reporting that the placid, winding Blanchard River, which more than 20 years ago inspired Tell Taylor to write the famous song, "Down by The Old Mill Stream," had become grossly polluted and that Ohio State Department of Health engineers had promised to investigate the situation but expressed doubt that the condition could be remedied.

Factories have sprung up and a sewage plant has begun discharging its effluent into the stream, since Mr. Taylor, now retired and taking it easy in Findlay, stuck his fishing pole in the river bank near the old Misomore Mill and got the idea that sold 4,000,000 copies.

Built to Stand

THE TEST OF TIME

Dependable service from water producing equipment is highly valued—and demanded by all Municipal executives. For more than fifty-three years Layne Wells and Pumps have been engineered and built to stand the unmerciful test of time. Today, their performance record remains unbroken—a commendable tribute to skillful engineering and successful installation methods.

The world-wide experience of our hydrological engineers is offered to all who face water production problems. No obligation. For illustrated literature, write Layne & Bowler, Inc., Dept. B, Memphis, Tenn.

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LAYNE PUMPS
LAYNE WELL WATER SYSTEMS

Financial Statistics of Cities: 1926-1934 Sanitation Service

THE per capita cost of sanitation service of the 94 cities having a population of over 100,000 shows an average cost per person for the larger cities greater than that for the smaller ones, according to a report released recently by Director William L. Austin, Bureau of the Census, Department of Commerce. There is a marked variation in the per capita costs of sanitation service in the individual cities, ranging from $0.29 to $6.44 for the year 1934.

This is one of a series of releases on the total and per capita costs of the general departments of city governments for specified years.

The per capitas for 1933 and 1926 are based on the estimated population as of the middle of the fiscal year of each city, and those for 1934 are based on the estimated population as of July 1, 1933, no later estimates having been made, except for Washington, D. C., estimated as of January 1, 1934.

These statistics cover the government of the city corporation proper and also independent districts practically coextensive with the cities. They also include a percentage of the financial transactions of the county government for cities having over 300,000 population, in order that data for such cities may be comparable with those of other cities in this class in which the ordinary county functions are performed by the city governments.

Among the expenses of sanitation service are payments for the operation and maintenance of sewers, for sewage purification or disposal, street cleaning, collection and disposal of household and trade wastes, smoke inspection, public comfort stations, and inspection incident to the enforcement of sanitary regulations.

Classification of expenditures is based on functional activities and not on fund or budgetary appropriations.

SEWAGE NOTES

WPA Sewer Work in New York City

IN the 11 months since Works Progress Administration projects began in New York City, 48 miles of sewers have been built in the five boroughs, and an average of 15,810 workers have been employed. In the borough of Manhattan alone, there were 48 sewer jobs in progress with a total length of 26,274 feet. The workers completed 12,727 feet of reinforced concrete sewer in this borough, ranging in size from 3 x 4 feet to 6 feet by 10 feet 6 inches, this work requiring the removal of 13,685 linear feet of pavement and 54,860 cubic yards of excavation. They also completed 3,173 linear feet of new barrel sewer, the wooden structures suspended under downtown piers to carry the flow from the regular sewers to the pier-end line.

Other sewer jobs in progress include the building of a reinforced concrete outlet sewer, 6 feet x 10 feet 6 inches, at 80th Street and the Hudson River, extending from a point in Riverside Park, under four main operating tracks of the New York Central Railroad, to the bulkhead line.

In Brooklyn, the reconstruction of 9,000 linear feet of large brick and concrete sewers was completed during this 11-month period: 83,634 feet of vitrified pipe sewers, ranging in diameter from 6 to 24 inches, were laid; and over 65 miles of sewers were cleaned. Ten sewers under construction in the Bronx include 600 linear feet of reinforced concrete twin barrel sewer, each section 11 feet x 8 feet 7½ inches. Most of the Bronx jobs were of 30-inch vitrified pipe. Storm sewers to relieve flood conditions furnished the main part of the program in Queens, this work including the laying of 7,300 feet of 6-inch concrete pipe,

(*Continued in column* 1, *page* 13)

GROUP I.—CITIES OF 500,000 AND OVER

	1934			1933		1926	
	Total	Per Capita	Per Cent of All General Departments	Per Capita	Per Cent of All General Departments	Per Capita	Per Cent of All General Departments
NEW YORK, N. Y.	$29,913,973	$4.18	5.9	$5.21	7.6	$4.47	9.2
Sewers and sewage disposal	2,235,200	0.31	0.4	0.62	0.9	0.40	0.8
Street cleaning	12,524,289	1.75	2.5	1.46	2.1	[4] 01	[18] 3
Refuse collection and disposal	14,554,142	2.04	2.9	3.07	4.5	[1]	[1]
Other sanitation	600,342	0.08	0.1	0.06	0.1	0.06	0.1
CHICAGO, ILL.	7,957,231	2.28	6.3	2.22	5.6	4.20	10.2
Sewers and sewage disposal	2,396,355	0.69	1.9	0.73	1.8	1.78	4.3
Street cleaning	2,383,277	0.68	1.9	0.66	1.7	0.80	2.0
Refuse collection and disposal	2,923,138	0.84	2.3	0.76	1.9	1.52	3.7
Other sanitation	254,461	0.07	0.2	0.07	0.2	0.10	0.2
PHILADELPHIA, PA.	4,269,452	2.16	5.5	1.93	4.8	3.77	8.9
Sewers and sewage disposal	91,034	0.05	0.1	0.05	0.1	0.20	0.5
Street cleaning	2,090,365	1.06	2.7	0.82	2.0	1.60	3.8
Refuse collection and disposal	1,898,470	0.96	2.4	0.99	2.5	1.87	4.4
Other sanitation	189,583	0.09	0.3	0.07	0.2	0.10	0.2
DETROIT, MICH.	3,828,316	2.30	5.3	2.23	5.4	3.37	7.7
Sewers and sewage disposal	541,764	0.33	0.8	0.30	0.7	0.31	0.7
Street cleaning	1,971,515	1.18	2.7	1.13	2.7	1.88	4.3
Refuse collection and disposal	1,179,967	0.71	1.6	0.73	1.8	1.05	2.4
Other sanitation	135,070	0.08	0.2	0.07	0.2	0.13	0.3
LOS ANGELES, CALIF.	2,004,031	1.48	2.7	1.82	3.4	1.90	3.5
Sewers and sewage disposal	261,227	0.19	0.3	0.17	0.3	0.19	0.4
Street cleaning	662,415	0.49	0.9	0.73	1.4	0.70	1.3
Refuse collection and disposal	866,260	0.64	1.2	0.70	1.3	0.85	1.5
Other sanitation	214,129	0.16	0.3	0.22	0.4	0.16	0.3
CLEVELAND, OHIO	1,592,415	1.73	3.7	1.74	3.9	3.25	7.4
Sewers and sewage disposal	253,123	0.28	0.6	0.29	0.7	0.31	0.7
Street cleaning	186,888	0.20	0.4	0.16	0.4	1.46	3.3
Refuse collection and disposal	1,012,768	1.10	2.4	1.12	2.5	1.18	2.7
Other sanitation	139,636	0.15	0.3	0.17	0.3	0.30	0.77
ST. LOUIS, MO.	933,107	1.12	3.0	1.33	3.6	1.67	4.6
Sewers and sewage disposal	212,645	0.26	0.7	0.32	0.9	0.24	0.7
Street cleaning	358,966	0.43	1.2	0.56	1.5	0.85	2.3
Refuse collection and disposal	246,467	0.29	0.8	0.30	0.8	0.45	1.2
Other sanitation	115,029	0.14	0.3	0.15	0.4	0.13	0.4
BALTIMORE, MD.	2,332,092	2.85	6.8	2.58	6.7	2.94	8.6
Sewers and sewage disposal	332,911	0.41	1.0	0.41	1.1	0.75	2.2
Street cleaning	827,795	1.01	2.4	0.48	1.2	0.77	2.2
Refuse collection and disposal	1,049,302	1.28	3.0	1.58	4.1	1.26	3.7
Other sanitation	121,884	0.15	0.4	0.11	0.3	0.16	0.5
BOSTON, MASS.	2,883,204	3.66	4.9	4.13	5.4	5.19	8.3
Sewers and sewage disposal	618,114	0.79	1.1	0.87	1.1	1.08	1.7
Street cleaning	290,162	0.37	0.5	0.46	0.6	1.14	1.8
Refuse collection and disposal	1,811,835	2.30	3.1	2.56	3.4	2.75	4.4
Other sanitation	163,093	0.20	0.2	0.24	0.3	0.22	0.4
PITTSBURGH, PA.	2,160,548	3.18	6.4	2.75	5.8	4.67	9.2
Sewers and sewage disposal	75,155	0.11	0.2	0.08	0.2	0.13	0.3
Street cleaning	363,295	0.54	1.1	0.54	1.1	1.10	2.2
Refuse collection and disposal	1,522,369	2.24	4.5	1.83	3.9	3.09	6.0
Other sanitation	199,729	0.29	0.6	0.30	0.6	0.35	0.7
SAN FRANCISCO, CALIF.	697,725	1.06	2.1	1.10	2.1	1.50	3.5
Sewers and sewage disposal	237,918	0.36	0.7	0.41	0.8	0.48	1.1
Street cleaning	432,877	0.66	1.3	0.67	1.3	0.98	2.3
Refuse collection and disposal	6,500	0.01	[1]	0.01	[1]	0.01	[1]
Other sanitation	20,430	0.03	0.1	0.01	[1]	0.03	0.1
MILWAUKEE, WIS.	2,237,564	3.73	6.1	3.95	7.2	3.80	8.7
Sewers and sewage disposal	1,003,594	1.67	2.7	1.47	2.7	.57	1.3
Street cleaning	217,156	0.36	0.6	0.66	1.2	1.07	2.5
Refuse collection and disposal	903,436	1.51	2.5	1.61	2.9	1.85	4.2
Other sanitation	113,378	0.19	0.3	0.21	0.4	0.31	0.7
BUFFALO, N. Y.	1,744,884	2.99	4.2	3.06	4.2	4.13	7.5
Sewers and sewage disposal	88,634	0.15	0.2	0.15	0.2	0.17	0.3
Street cleaning	370,399	0.63	0.9	0.72	1.0	0.94	1.7
Refuse collection and disposal	1,159,718	1.99	2.8	1.95	2.7	2.84	5.2
Other sanitation	126,133	0.22	0.3	0.24	0.3	0.18	0.3
WASHINGTON, D. C.	1,821,499	3.40	5.3	4.09	6.5	3.85	7.1
Sewers and sewage disposal	465,069	0.87	1.4	1.12	1.8	0.76	1.4
Street cleaning	577,313	1.08	1.7	1.29	2.0	1.07	2.0
Refuse collection and disposal	726,701	1.36	2.1	1.56	2.5	1.89	3.5
Other sanitation	52,416	0.09	0.1	0.12	0.2	0.13	0.2

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Sewage Notes

(Continued)

4,750 feet of 48-inch concrete pipe and 4,200 feet of 30-inch concrete pipe. In Richmond, over 32 miles of natural watercourses were cleaned, reinforced concrete culverts built, old sewers repaired and new sewers built.

Water for Air Cooling Overloaded City Sewers

THE water used for air-cooling systems for office buildings and other structures in Hutchinson, Kans., is not a tax on the water-supply sources of the city. Ninety-five per cent of the systems which use water for cooling in this city sink their own well to a depth of 30 to 40 feet. This stratum of water averages 59 to 60 degrees F. and is several degrees cooler than the city water.

Our greatest trouble is the disposition of the water after it has been used for air-cooling. The sewers are already overtaxed and the addition of this water has created a serious situation. In some cases the owners have discharged the water into another well, but it requires only a short time before the supply well has drawn this warmer water into the system.

Not only does the additional volume of water tax the capacity of the city sewers, but we face the situation of treating this additional volume in our disposal plant, which is now under construction. The estimates on the cost of treating this extra volume show 10 cents per gallon per year, and we do not feel justified in treating an additional amount of pure water.

An ordinance has been passed by the City Commission requiring that the discharge from all cooling systems be connected to the storm sewers. Naturally, this is not practical in all cases, but we are doing the best we can to keep this large volume of dilution water from the sanitary sewers and the new sewage-treatment plant.

H. P. Hertz,
City Engineer.

Important Operation Items in Activated Sludge Plants

1. Observe how the sewage load varies through the day and with the season of the year. Determine what adjustments are necessary to meet these variable conditions.

2. Know what industrial wastes are being delivered to the sewers for treatment. Much work, expense and worry may be avoided by seeking a little co-operation, friendly, if possible, compulsory, if not, from an industry.

3. Watch the digester supernatant liquor. A place to dispose of it when temporarily bad is invaluable, only don't

(Continued in column 1, page 15)

Sanitation Services

(Continued from page 11)

GROUP II.—CITIES OF 300,000 TO 500,000

	1934			1933			1926		
	Total	Per Capita	Per Cent of All General Departments	Per Capita	Per Cent of All General Departments		Per Capita	Per Cent of All General Departments
MINNEAPOLIS, MINN.	$598,066	$1.25	2.5	$1.06	2.6		$1.64	4.1
Sewers and sewage disposal	162,717	0.34	0.7	0.22	0.6		0.24	0.6
Street cleaning	135,684	0.28	0.6	0.21	0.5		0.56	1.4
Refuse collection and disposal	243,049	0.51	1.0	0.52	1.2		0.67	1.7
Other sanitation	56,616	0.12	0.2	0.11	0.3		0.17	0.4
NEW ORLEANS, LA.	1,141,448	2.42	9.5	2.23	8.9		2.83	10.9
Sewers and sewage disposal	375,788	0.80	3.1	0.69	2.8		1.14	4.4
Street cleaning	236,338	0.50	2.0	0.48	1.9		0.51	2.0
Refuse collection and disposal	488,417	1.03	4.1	0.94	3.7		1.13	4.3
Other sanitation	40,905	0.09	0.3	0.12	0.5		0.05	0.2
CINCINNATI, OHIO	880,179	1.91	3.7	1.78	3.7		1.84	4.5
Sewers and sewage disposal	116,896	0.25	0.5	0.25	0.5		0.25	0.6
Street cleaning	356,136	0.77	1.5	0.68	1.4		1.03	2.5
Refuse collection and disposal	356,850	0.78	1.5	0.74	1.6		0.47	1.2
Other sanitation	50,297	0.11	0.2	0.11	0.2		0.09	0.2
NEWARK, N. J.	1,709,779	3.83	6.3	3.58	6.0		4.79	8.4
Sewers and sewage disposal	350,498	0.79	1.3	0.73	1.2		0.80	1.4
Street cleaning	494,238	1.11	1.8	0.99	1.7		0.99	1.7
Refuse collection and disposal	591,780	1.32	2.2	1.25	2.1		2.51	4.4
Other sanitation	273,263	0.61	1.0	0.61	1.0		0.49	0.9
KANSAS CITY, MO.	734,839	1.78	5.4	1.97	5.5		1.58	3.9
Sewers and sewage disposal	2,486	0.01	*	0.01	*		0.11	0.3
Street cleaning	251,070	0.61	1.8	0.70	2.0		0.75	1.8
Refuse collection and disposal	444,022	1.07	3.3	1.12	3.1		0.65	1.6
Other sanitation	37,261	0.09	0.3	0.14	0.4		0.07	0.2
SEATTLE, WASH.	601,625	1.61	4.1	1.59	4.0		2.92	7.2
Sewers and sewage disposal	113,915	0.30	0.8	0.29	0.8		0.47	1.2
Street cleaning	70,085	0.19	0.5	0.17	0.4		0.44	1.1
Refuse collection and disposal	369,262	0.99	2.5	1.00	2.5		1.83	4.4
Other sanitation	48,363	0.13	0.3	0.13	0.3		0.18	0.5
INDIANAPOLIS, IND.	591,310	1.59	4.7	1.48	4.1		1.90	5.2
Sewers and sewage disposal	163,073	0.44	1.3	0.40	1.1		0.64	1.7
Street cleaning	142,181	0.38	1.1	0.31	0.9		0.36	1.0
Refuse collection and disposal	260,612	0.70	2.1	0.69	1.9		0.84	2.3
Other sanitation	25,444	0.07	0.2	0.08	0.2		0.06	0.2
ROCHESTER, N. Y.	1,241,872	3.72	5.0	4.00	6.3		5.25	10.0
Sewers and sewage disposal	153,171	0.46	0.6	0.43	0.7		0.38	0.7
Street cleaning	163,796	0.49	0.7	0.84	1.3		0.93	1.7
Refuse collection and disposal	870,098	2.61	3.5	2.54	4.0		3.89	7.3
Other sanitation	54,807	0.16	0.2	0.19	0.3		0.15	0.3
JERSEY CITY, N. J.	926,014	2.89	4.6	3.07	4.7		3.40	6.1
Sewers and sewage disposal	46,437	0.15	0.2	0.16	0.2		0.19	0.3
Street cleaning	337,937	1.05	1.7	1.24	1.9		1.67	3.0
Refuse collection and disposal	461,814	1.44	2.3	1.41	2.2		1.30	2.3
Other sanitation	79,826	0.25	0.4	0.26	0.4		0.24	0.5
HOUSTON, TEXAS	390,633	1.23	5.3	1.16	5.2		†2.09	†8.5
Sewers and sewage disposal	184,476	0.58	2.5	0.57	2.5		0.91	3.7
Street cleaning	30,185	0.09	0.4	0.08	0.4		0.23	1.0
Refuse collection and disposal	166,789	0.53	2.3	0.48	2.2		0.90	3.6
Other sanitation	9,183	0.03	0.1	0.03	0.1		0.05	0.2
LOUISVILLE, KY.	445,864	1.40	4.4	1.45	4.6		1.48	5.5
Sewers and sewage disposal	59,232	0.19	0.6	0.32	1.0		0.18	0.7
Street cleaning	101,067	0.32	1.0	0.29	0.9		0.39	1.4
Refuse collection and disposal	266,983	0.84	2.6	0.78	2.5		0.81	3.0
Other sanitation	18,582	0.05	0.2	0.06	0.2		0.10	0.4
PORTLAND, ORE.	349,842	1.13	3.2	1.39	3.4		‡1.56	‡5.1
Sewers and sewage disposal	61,298	0.20	0.6	0.25	0.6		0.23	0.7
Street cleaning	202,820	0.66	1.8	0.74	1.8		0.92	3.0
Refuse collection and disposal	38,747	0.12	0.4	0.14	0.4		0.14	0.5
Other sanitation	46,977	0.15	0.4	0.26	0.6		0.27	0.9

GROUP III.—CITIES OF 100,000 TO 300,000

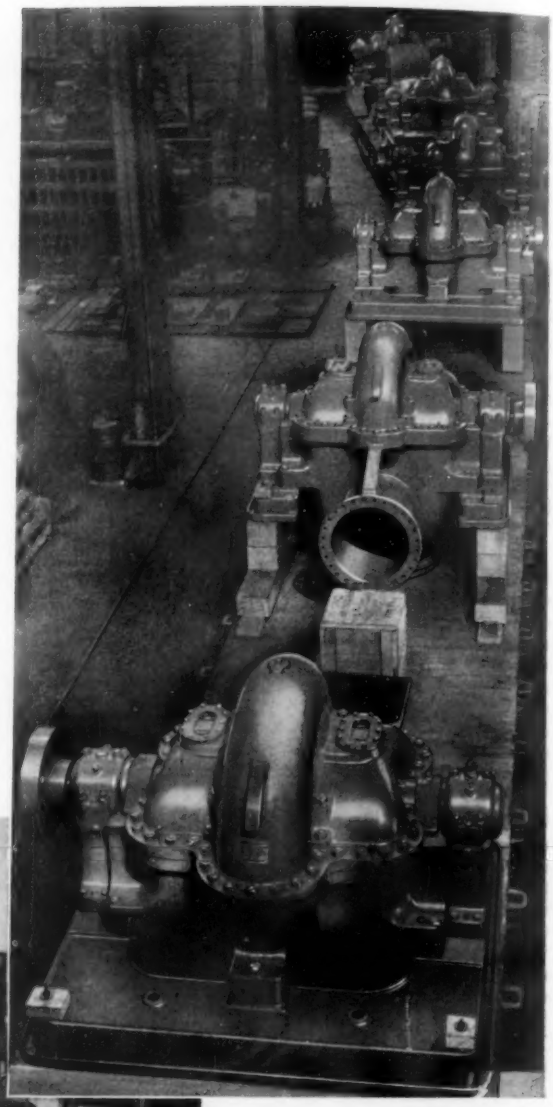
COLUMBUS, OHIO	$394,365	$1.32	5.2	$1.58	5.1		$2.03	7.1
Sewers and sewage disposal	82,980	0.28	1.1	0.26	0.9		0.39	1.4
Street cleaning	81,758	0.27	1.1	0.28	0.9		0.69	2.4
Refuse collection and disposal	212,828	0.71	2.8	0.98	3.1		0.84	2.9
Other sanitation	16,799	0.06	0.2	0.06	0.2		0.11	0.4
TOLEDO, OHIO	430,417	1.44	5.5	1.77	5.4		1.63	5.2
Sewers and sewage disposal	114,873	0.38	1.5	0.38	1.2		0.25	0.8
Street cleaning	140,596	0.47	1.8	0.64	1.9		0.77	2.4
Refuse collection and disposal	169,027	0.57	2.1	0.66	2.0		0.50	1.6
Other sanitation	5,921	0.02	0.1	0.09	0.3		0.11	0.4
OAKLAND, CALIF.	275,016	0.93	2.9	0.87	2.6		1.52	4.3
Sewers and sewage disposal	87,149	0.29	0.9	0.16	0.5		0.22	0.6
Street cleaning	156,742	0.53	1.7	0.55	1.6		0.87	2.5
Refuse collection and disposal	14,384	0.05	0.2	0.10	0.3		0.31	0.9
Other sanitation	16,741	0.06	0.1	0.06	0.2		0.12	0.3
DENVER, COLO.	374,280	1.28	3.1	1.59	3.8		1.70	4.1
Sewers and sewage disposal	30,883	0.11	0.3	0.13	0.3		0.20	0.5
Street cleaning	288,779	0.98	2.4	1.24	3.0		1.19	2.9
Refuse collection and disposal	17,500	0.06	0.1	0.06	0.1		0.10	0.2
Other sanitation	37,118	0.13	0.3	0.16	0.4		0.21	0.5
ATLANTA, GA.	490,619	1.75	6.7	1.66	6.8		1.83	7.1
Sewers and sewage disposal	85,097	0.30	1.2	0.23	1.0		0.21	0.8
Street cleaning	147,225	0.53	2.0	0.55	2.2		0.68	2.6
Refuse collection and disposal	240,756	0.86	3.3	0.77	3.1		0.86	3.3
Other sanitation	17,541	0.06	0.2	0.11	0.5		0.08	0.4
DALLAS, TEXAS	354,492	1.28	6.5	1.30	5.2		2.10	8.7
Sewers and sewage disposal	91,782	0.33	1.7	0.30	1.2		0.45	1.9
Street cleaning	53,941	0.20	1.0	0.22	0.9		0.54	2.2
Refuse collection and disposal	191,306	0.69	3.5	0.74	3.0		1.03	4.3
Other sanitation	17,463	0.06	0.3	0.04	0.1		0.08	0.3
ST. PAUL, MINN.	216,163	0.78	2.9	0.92	3.3		1.19	3.8
Sewers and sewage disposal	52,224	0.19	0.7	0.32	1.1		0.29	0.9
Street cleaning	99,965	0.36	1.3	0.36	1.3		0.49	1.6
Refuse collection and disposal	63,974	0.23	0.9	0.23	0.8		0.27	0.9
Other sanitation	.....	....	...	0.01	0.1		0.14	0.4
BIRMINGHAM, ALA.	211,781	0.77	5.1	0.74	4.8		1.25	6.2
Sewers and sewage disposal	17,512	0.06	0.4	0.07	0.5		0.20	1.0
Street cleaning	41,127	0.15	1.0	0.15	1.0		0.22	1.1
Refuse collection and disposal	142,994	0.52	3.4	0.48	3.1		0.66	3.3
Other sanitation	10,148	0.04	0.3	0.04	0.2		0.17	0.8
AKRON, OHIO	214,321	0.81	3.6	1.04	4.4		1.71	6.8
Sewers and sewage disposal	67,858	0.26	1.1	0.39	1.6		0.24	1.0
Street cleaning	62,557	0.24	1.0	0.30	1.3		0.79	3.1
Refuse collection and disposal	80,804	0.30	1.4	0.33	1.4		0.66	2.6
Other sanitation	3,102	0.01	0.1	0.02	0.1		0.02	0.1

Cermak Station

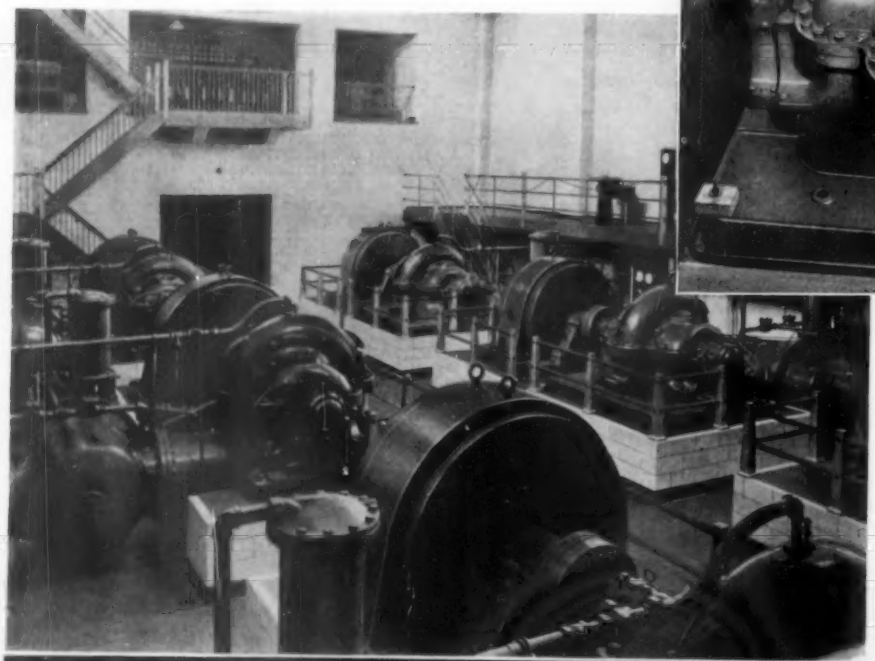
THE new Cermak Station at Chicago is another example of modernizing to save money. This station was built to replace three obsolete and uneconomical pumping stations and has an installed capacity of 300 million gallons per day. It is the largest electric motor driven pumping station in Chicago's water supply system.

The pumping equipment consists of six 36″x 30″ Allis-Chalmers pumps each rated at 50 mgd. against 136 ft. head. They are driven by 1500 hp. synchronous motors at 514 rpm. The pumps have an exceptionally high tested efficiency.

If your pumps are more than ten years old or if you need more capacity it will pay you to get in touch with Allis-Chalmers.



The Six 36″x 30″ Pumps leaving the Allis-Chalmers Plant



EQUIPMENT ENGINEERS TO INDUSTRY

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A-C ENGINEERED

Blowers, Compressors and Vacuum Pumps.
Cement Making Machinery, Rock Crushers, Screens, Roadbuilding Equipment.
Centrifugal Pumps.
Electric Generators, Transformers, Converters, Rectifiers, Switchgear and Regulators.
Electric Motors for all purposes.
Farm Machinery, Road Machinery, Farm and Industrial Tractors.
Flour, Feed and Flaking Mill Machinery.
Hydraulic Turbines and Accessories.
Mining, Metallurgical and Hoisting Equipment.
Sawmill and Timber Preserving Machinery.
Steam Turbines, Steam Engines and Condensers.
Texrope Drives.
Water Wheels and Accessories.

Bulletins for various types of equipment furnished on request. Address Allis-Chalmers Mfg. Company, Milwaukee, Wisconsin

Sewage Notes

(Continued)

discharge it to a stream. Be careful at all times when returning supernatant for treatment to do it slowly and evenly.

4. Study the aeration tanks for short-circuiting. Be sure you are using all of the aeration period that you think is being used.

5. Power to supply aeration costs money. Use sufficient air in the right place but don't be wasteful.

6. Establish the proper aeration solids concentrations to meet all conditions in the plant. Don't keep any more working organisms on the payroll than necessary, but keep enough on hand to meet peak loads and shocks. This is most important.

7. Always waste sludge slowly and evenly—don't waste in heavy "slugs."

8. Don't let septic conditions get started in the final settling tank. It is usually better to return sludge at a liberal ly high rate than too slowly. Vary the rate of return somewhat to meet daily peaks. Don't let too heavy a sludge blanket accumulate.

9. When difficulties arise, seek the cause first. Then corrective action may be carried out more quickly and efficiently.

—From *The Digester*, Illinois State Department of Health.

Stream Pollution in New Jersey

THE problem of stream pollution in New Jersey is intensified because of the density of population and industrial development. The sewage pollution of streams and watercourses depends upon the volume discharged and the degree of treatment. About 85 per cent of the population of New Jersey is provided with sewers and sewerage systems. The sewage of about 1,000,000 persons is discharged untreated, that from 2,200,000 is partially or completely treated, and the disposal of household wastes by about 800,000 is still into cesspools and septic tanks or on land.

The amount of dry solids originating from sewage and discharged into interstate streams is over 45,000 tons a year, or a volume of sludge amounting to over 900,000 tons a year. These solids are subject to decomposition, producing odors and other nuisances, interfering with fish life, and requiring oxygen from the water for stabilization. The pollution load upon the streams in terms of oxygen is 750,000 pounds of oxygen daily. The oxygen resources of a stream consist of the oxygen present in solution. The quantity of oxgyen which will dissolve in the water under ordinary conditions amounts to only 50 to 100 pounds per million gallons of water. If the water contains less than 25 pounds of oxygen per million gallons, fish migrate or die.

Industrial wastes are greatly diversified. A number of industries require little or no water; others, such as dyeing and finishing of textiles, production of

(Continued in column 1, page 17)

GROUP III.—CITIES OF 100,000 TO 300,000 (Continued)

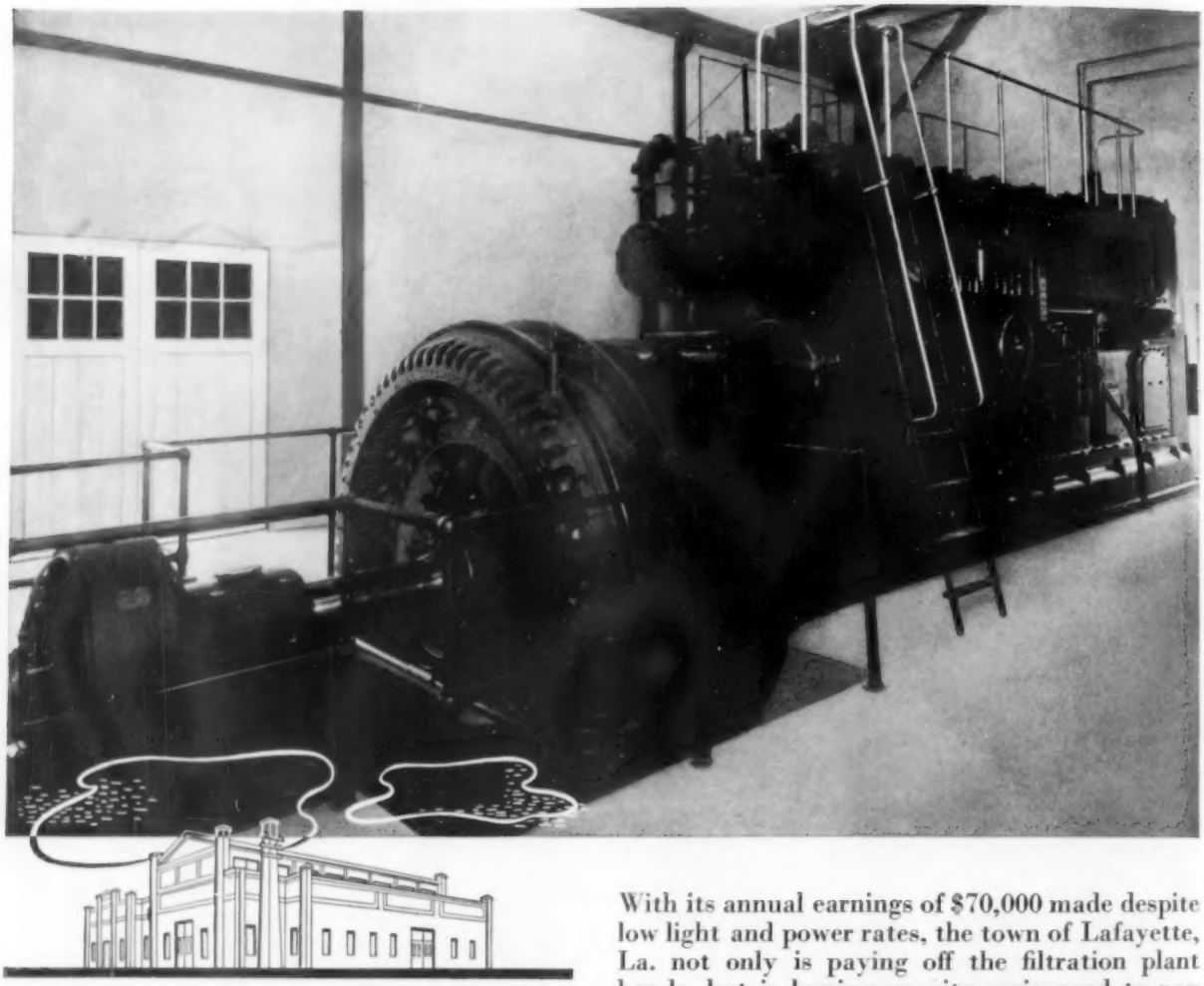
SANITATION SERVICES

(Continued from page 13)

	1934			1933			1926		
	Total	Per Capita	Per Cent of All General Departments	Per Capita	Per Cent of All General Departments		Per Capita	Per Cent of All General Departments
MEMPHIS, TENN.	310,352	1.19	6.3	1.12	6.2		2.38	8.8
Sewers and sewage disposal	46,030	0.18	0.9	0.17	0.9		0.58	2.2
Street cleaning	59,706	0.23	1.2	1.19	1.1		0.46	1.7
Refuse collection and disposal	178,171	0.68	3.6	0.66	3.6		1.16	4.3
Other sanitation	26,445	0.10	0.6	0.10	0.6		0.18	0.6
PROVIDENCE, R. I.	681,256	2.67	6.0	2.87	5.9		2.35	6.4
Sewers and sewage disposal	325,667	1.28	2.9	1.10	2.3		1.11	3.0
Street cleaning	92,456	0.36	0.8	0.58	1.2		0.68	1.9
Refuse collection and disposal	196,734	0.77	1.7	0.92	1.9		0.38	1.0
Other sanitation	66,399	0.26	0.6	0.27	0.5		0.18	0.5
SAN ANTONIO, TEXAS	267,689	1.10	7.7	1.19	8.3		1.86	8.6
Sewers and sewage disposal	81,392	0.34	2.4	0.31	2.1		0.12	0.6
Street cleaning	73,935	0.30	2.1	0.41	2.9		0.52	2.4
Refuse collection and disposal	101,720	0.42	2.9	0.42	2.9		1.05	4.8
Other sanitation	10,642	0.04	0.3	0.05	0.4		0.17	0.8
OMAHA, NEBR.	161,735	0.74	3.1	0.61	2.3		0.93	2.8
Sewers and sewage disposal	32,091	0.15	0.6	0.08	0.3		0.11	0.3
Street cleaning	34,108	0.16	0.7	0.10	0.4		0.22	0.7
Refuse collection and disposal	75,040	0.34	1.4	0.35	1.3		0.45	1.4
Other sanitation	20,496	0.09	0.4	0.08	0.3		0.15	0.4
SYRACUSE, N. Y.	738,279	3.44	6.4	2.76	5.5		3.44	8.9
Sewers and sewage disposal	98,269	0.46	0.9	0.47	0.9		0.23	0.6
Street cleaning	252,579	1.18	2.2	0.68	1.4		1.32	3.4
Refuse collection and disposal	371,008	1.73	3.2	1.49	3.0		1.83	4.7
Other sanitation	16,423	0.07	0.1	0.12	0.2		0.06	0.2
DAYTON, OHIO	363,530	1.76	7.3	1.83	5.9		1.92	6.4
Sewers and sewage disposal	201,739	0.98	4.1	1.04	3.3		0.26	0.9
Street cleaning	38,316	0.19	0.8	0.18	0.6		0.31	1.0
Refuse collection and disposal	109,966	0.53	2.2	0.54	1.8		1.22	4.1
Other sanitation	13,509	0.06	0.2	0.07	0.2		0.13	0.4
OKLAHOMA CITY, OKLA.	208,601	1.04	5.8	1.61	8.1		1.14	5.6
Sewers and sewage disposal	45,319	0.23	1.3	0.56	2.8		0.24	1.2
Street cleaning	73,152	0.36	2.0	0.54	2.7		0.40	2.0
Refuse collection and disposal	80,746	0.40	2.3	0.44	2.2		0.43	2.1
Other sanitation	9,384	0.05	0.2	0.07	0.4		0.07	0.3
WORCESTER, MASS.	413,878	2.09	3.9	1.60	3.0		2.67	5.8
Sewers and sewage disposal	171,887	0.87	1.6	0.43	0.8		0.79	1.7
Street cleaning	88,699	0.45	0.8	0.46	0.8		0.73	1.6
Refuse collection and disposal	134,328	0.68	1.3	0.62	1.2		1.05	2.3
Other sanitation	18,964	0.09	0.2	0.09	0.2		0.10	0.2
RICHMOND, VA.	333,877	1.81	5.9	1.82	5.6		2.08	7.2
Sewers and sewage disposal	44,842	0.24	0.8	0.24	0.8		0.20	0.7
Street cleaning	54,980	0.30	1.0	0.33	1.0		0.54	1.9
Refuse collection and disposal	213,442	1.16	3.8	1.14	3.5		1.16	4.0
Other sanitation	20,613	0.11	0.3	0.11	0.3		0.18	0.6
YOUNGSTOWN, OHIO	179,387	1.03	3.3	0.96	2.9		1.04	3.8
Sewers and sewage disposal	27,187	0.16	0.5	0.18	0.5		0.12	0.4
Street cleaning	42,524	0.24	0.8	0.22	0.7		0.14	0.5
Refuse collection and disposal	88,670	0.51	1.6	0.50	1.5		0.70	2.6
Other sanitation	21,006	0.12	0.4	0.06	0.2		0.08	0.3
GRAND RAPIDS, MICH.	144,483	0.84	3.0	1.09	2.9		1.70	4.8
Sewers and sewage disposal	61,704	0.36	1.3	0.46	1.2		0.58	1.6
Street cleaning	27,169	0.16	0.5	0.24	0.6		0.60	1.7
Refuse collection and disposal	52,107	0.30	1.1	0.37	1.0		0.50	1.4
Other sanitation	3,503	0.02	0.1	0.02	0.1		0.02	0.1
FORT WORTH, TEXAS	220,593	1.30	5.8	1.37	6.4		1.45	6.9
Sewers and sewage disposal	55,782	0.33	1.5	0.41	1.9		0.30	1.4
Street cleaning	50,817	0.30	1.3	0.29	1.4		0.40	1.9
Refuse collection and disposal	103,152	0.61	2.7	0.61	2.8		0.71	3.4
Other sanitation	10,842	0.06	0.3	0.06	0.3		0.04	0.2
HARTFORD, CONN.	442,395	2.63	5.0	3.02	5.6		3.53	8.2
Sewers and sewage disposal	31,268	0.19	0.3	0.18	0.3		0.22	0.5
Street cleaning	139,228	0.83	1.6	0.92	1.7		1.05	2.4
Refuse collection and disposal	229,791	1.36	2.6	1.65	3.1		1.97	4.6
Other Sanitation	42,108	0.25	0.5	0.27	0.5		0.29	0.7
FLINT, MICH.	137,890	0.82	2.7	0.68	2.4		2.16	7.7
Sewers and sewage disposal	13,064	0.08	0.2	0.09	0.3		0.38	1.3
Street cleaning	13,380	0.08	0.3	0.08	0.3		0.26	0.9
Refuse collection and disposal	108,798	0.65	2.1	0.50	1.8		1.48	5.3
Other sanitation	2,648	0.01	0.1	0.01	[a]		0.04	0.2
NEW HAVEN, CONN.	259,219	1.59	3.5	1.72	3.6		1.75	4.6
Sewers and sewage disposal	62,598	0.38	0.8	0.43	0.9		0.20	0.5
Street cleaning	100,535	0.62	1.4	0.68	1.4		0.77	2.0
Refuse collection and disposal	66,851	0.41	0.9	0.44	0.9		0.61	1.6
Other sanitation	29,235	0.18	0.4	0.17	0.4		0.17	0.5
SAN DIEGO, CALIF.	215,039	1.34	4.8	1.64	5.1		2.24	6.6
Sewers and sewage disposal	32,079	0.20	0.7	0.25	0.8		0.40	1.2
Street cleaning	45,755	0.28	1.0	0.43	1.3		0.30	0.9
Refuse collection and disposal	127,456	0.80	2.9	0.91	2.8		1.49	4.4
Other sanitation	9,749	0.06	0.2	0.05	0.2		0.05	0.1
LONG BEACH, CALIF.	304,898	1.94	5.5	2.10	5.8		3.33	7.6
Sewers and sewage disposal	40,382	0.26	0.7	0.33	0.9		0.76	1.7
Street cleaning	56,958	0.36	1.0	0.42	1.2		0.49	1.1
Refuse collection and disposal	175,298	1.11	3.2	1.14	3.1		1.60	3.7
Other sanitation	32,260	0.21	0.6	0.21	0.6		0.48	1.1
NASHVILLE, TENN.	212,283	1.36	6.3	1.42	6.9		1.36	6.7
Sewers and sewage disposal	4,622	0.03	0.1	0.03	0.1		0.02	0.1
Street cleaning	56,963	0.37	1.7	0.35	1.7		0.50	2.4
Refuse collection and disposal	106,686	0.68	3.2	0.77	3.8		0.72	3.6
Other sanitation	44,012	0.28	1.3	0.27	1.3		0.12	0.6
SPRINGFIELD, MASS.	569,930	3.72	6.5	3.46	5.7		3.85	7.6
Sewers and sewage disposal	24,796	0.16	0.3	0.17	0.3		0.65	1.3
Street cleaning	137,065	0.89	1.6	0.70	1.2		0.93	1.9
Refuse collection and disposal	378,099	2.47	4.3	2.39	3.9		2.05	4.0
Other sanitation	29,970	0.20	0.3	0.20	0.3		0.22	0.4
TULSA, OKLA.	119,638	0.81	4.1	0.70	3.1		1.37	4.7
Sewers and sewage disposal	29,155	0.20	1.0	0.29	1.2		0.34	1.2
Street cleaning	46,500	0.32	1.6	0.07	0.3		0.40	1.4
Refuse collection and disposal	39,001	0.26	1.3	0.28	1.3		0.50	1.7
Other sanitation	4,982	0.03	0.2	0.06	0.3		0.13	0.4
BRIDGEPORT, CONN.	402,826	2.73	5.2	2.79	5.5		2.66	7.3
Sewers and sewage disposal	68,251	0.46	0.9	0.43	0.8		0.43	1.2
Street cleaning	51,977	0.35	0.7	0.47	0.9		0.74	2.0
Refuse collection and disposal	271,136	1.84	3.5	1.81	3.6		1.41	3.9
Other sanitation	11,462	0.08	0.1	0.08	0.2		0.08	0.2
DES MOINES, IOWA	202,862	1.40	4.9	1.50	4.8		2.50	6.8
Sewers and sewage disposal	58,578	0.40	1.4	0.38	1.2		0.88	2.4
Street cleaning	63,624	0.44	1.5	0.47	1.5		0.68	1.8
Refuse collection and disposal	64,060	0.44	1.6	0.50	1.6		0.71	2.0
Other sanitation	16,600	0.12	0.4	0.15	0.5		0.23	0.6

LET'S LOOK AT THE RECORD

IN LAFAYETTE, LA.—(POP. 15,800)



GROSS REVENUE: $150,000

BILLS PAID BY LIGHT PLANT:

Operating expenses, fuel, lubricating oil, superintendence, labor, maintenance of auto and truck, insurance, repairs and maintenance of electric distribution system, repairs and maintenance on the water system, repairs and maintenance on the town's filtration plant. Average $80,000.

ANNUAL EARNINGS: $70,000

With its annual earnings of $70,000 made despite low light and power rates, the town of Lafayette, La. not only is paying off the filtration plant bonds, but is buying up city scrip used to pay city and relief employees in 1931 and 1932 — *in addition* to paying for the plant itself.

These savings of $70,000 yearly are eloquent testimony to what F-M Diesels can do in municipal service. For full information on what they can do for *your* town, address Department O91, Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 34 branches at your service throughout the U. S.

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106 YEARS OF PRECISION MANUFACTURING

FAIRBANKS-MORSE

Diesel Engines

POWER, PUMPING AND WEIGHING EQUIPMENT

Sewage Notes

(Continued)

chemicals, silk manufacturing, tanning, steel works, fermentation, dairies and power laundries, are among those producing larger quantities of waste, frequently of a highly putrescible nature or containing large amounts of suspended solids capable of settling in the streams. The quantity of solids produced by the industries and discharged into the streams amounts to 700,000 tons a year. The solids which will settle in the streams amount to nearly 100,000 tons a year.

On the basis of oxygen consumption, the industrial wastes are equivalent to the untreated sewage of over 3,000,000 people, or two-thirds of the total domestic waste produced by the entire population of the state. The oxygen requirements of the wet waste produced per employee by the different industries are from 3 to 470 times greater than the oxygen requirements of the sewage of one person.

—Prepared by Dr. W. Rudolfs, Chief, Division of Water and Sewage Research, Agricultural Experiment Station, New Brunswick, N. J.

Wood Covers for Winter over Aerators

AT the mechanical activated sludge plant at the State Reformatory for Women, Dwight, Ill., John Hofland, the Superintendent, placed loose plank covers over the aeration units last winter. According to a report in *The Digester*, published quarterly by the Division of Sanitary Engineering, State Department of Health of Illinois, the covers do not appear to have interfered with the efficiency of the operation in any way, and were effective in absolutely eliminating trouble from ice formation in the winter. Many operators of similar plants will be interested in this solution.

O. P. Rator Visits Utopia—A Fantasy in Sewage

A RECENT number of *The Digester*, issued quarterly by the Division of Sanitary Engineering, Illinois State Department of Public Health, contains a story of appreciation of the work of sewage-plant operators which will be enjoyed by that fraternity and which may be a lesson to municipal officials to look upon these men with a little more civic pride. Here's the story:

O. P. Rator couldn't understand it. Everything was going too smoothly. His plant effluent was excellent, as was the outlet stream; not a trace of odor around the place; the town milk plant had not dumped a whey tank to the sewer in months, and the grass, flowers and shrubs at the plant far outshone the local park. Rator could feel Dame Misfortune picking him up for a thumping letdown.

The telephone rang.

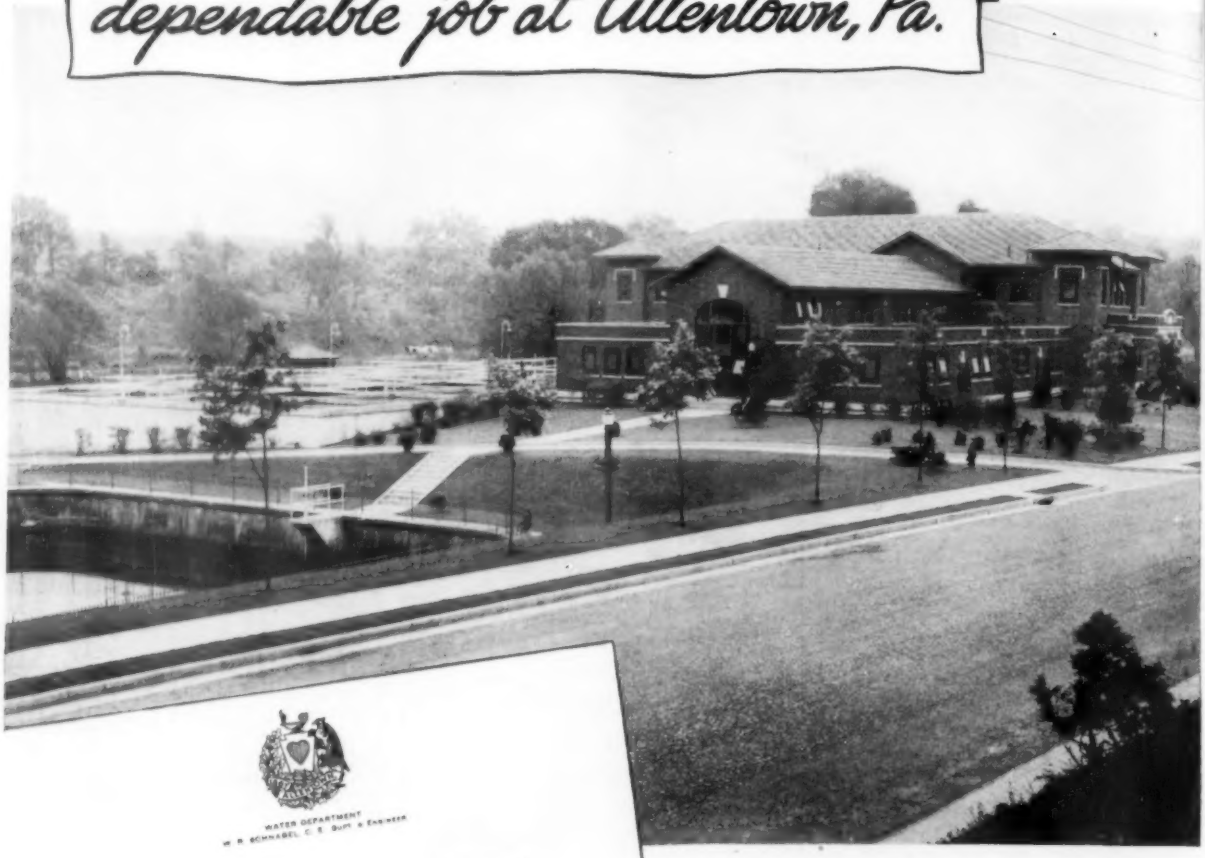
"Good morning, Mr. Rator," trilled Mrs. Smith, a neighbor to the plant. "I wanted to let you

(*Continued in column* 1, *page* 19)

Group III.—Cities of 100,000 to 300,000 (Continued)

Sanitation Services (*Contniued from page* 15)	1934 Total	1934 Per Capita	1934 Per Cent of All General Departments	1933 Per Capita	1933 Per Cent of All General Departments	1926 Per Capita	1926 Per Cent of All General Departments
Scranton, Pa.	269,746	1 87	5 9	1 83	5 4	2 35	7 9
Sewers and sewage disposal	34,539	0 24	0 8	0 26	0 8	0 39	1 3
Street cleaning	55,228	0 38	1 2	0 39	1 1	0 36	1 2
Refuse collection and disposal	167,541	1 16	3 6	1 11	3 3	1 52	5 1
Other sanitation	12,438	0 09	0 3	0 07	0 2	0 08	0 3
Salt Lake City, Utah	64,361	0 45	1 6	0 48	1 9	1 07	3 8
Sewers and sewage disposal	.....	....	...	0 05	0 2	0 19	0 7
Street cleaning	17,087	0 12	0 4	0 10	0 4	0 36	1 3
Refuse collection and disposal	34,517	0 24	0 9	0 24	1 0	0 41	1 4
Other sanitation	12,757	0 09	0 3	0 09	0 3	0 11	0 4
Yonkers, N. Y.	904,502	6 44	9 7	6 88	9 7	4 83	9 2
Sewers and sewage disposal	55,405	0 39	0 6	0 45	0 6	0 23	0 4
Street cleaning	165,022	1 18	1 8	1 34	1 9	0 70	1 3
Refuse collection and disposal	624,209	4 44	6 7	4 47	6 3	3 48	6 7
Other sanitation	59,866	0 43	0 6	0 62	0 9	0 42	0 8
Paterson, N. J.	399,319	2 87	6 5	2 71	6 6	3 36	8 6
Sewers and sewage disposal	167,739	1 21	2 7	1 25	3 0	1 45	3 7
Street cleaning	47,348	0 34	0 8	0 14	0 4	0 44	1 1
Refuse collection and disposal	173,356	1 24	2 8	1 24	3 0	1 33	3 4
Other sanitation	10,876	0 08	0 2	0 08	0 2	0 14	0 4
Jacksonville, Fla.	370,552	2 67	10 4	2 14	8 3	3 31	11 9
Sewers and sewage disposal	117,144	0 84	3 3	0 62	2 4	1 05	3 8
Street cleaning	65,218	0 47	1 8	0 33	1 3	1 65	5 9
Refuse collection and disposal	149,414	1 08	4 2	0 92	3 6	0 30	1 1
Other sanitation	38,776	0 28	1 1	0 27	1 0	0 31	1 1
Albany, N. Y.	578,771	4 46	8 3	3 99	8 2	3 65	9 7
Sewers and sewage disposal	99,184	0 76	1 4	0 72	1 5	0 67	1 8
Street cleaning	352,235	2 71	5 1	2 52	5 2	2 22	5 9
Refuse collection and disposal	76,014	0 59	1 1	0 33	0 7	0 26	0 7
Other sanitation	51,338	0 40	0 7	0 42	0 8	0 50	1 3
Norfolk, Va.	262,552	2 02	6 8	2 11	8 4	2 72	9 6
Sewers and sewage disposal	58,203	0 45	1 5	0 51	2 1	0 55	1 9
Street cleaning	54,166	0 42	1 4	0 53	2 1	0 97	3 5
Refuse collection and disposal	135,403	1 04	3 5	0 95	3 8	1 06	3 7
Other sanitation	14,780	0 11	0 4	0 12	0 4	0 14	0 5
Trenton, N. J.	292,749	2 36	6 5	2 43	5 7	2 60	6 8
Sewers and sewage disposal	85,529	0 69	1 9	0 71	1 7	0 34	0 9
Street cleaning	90,598	0 73	2 0	0 70	1 7	0 74	1 9
Refuse collection and disposal	98,871	0 80	2 2	0 87	2 0	1 27	3 3
Other sanitation	17,751	0 14	0 4	0 15	0 3	0 25	0 7
Chattanooga, Tenn.	95,055	0 77	4 0	0 77	4 2	1 33	5 5
Sewers and sewage disposal	15,584	0 13	0 7	0 15	0 8	0 16	0 7
Street cleaning	21,935	0 18	0 9	0 15	0 8	0 29	1 2
Refuse collection and disposal	50,613	0 41	2 1	0 41	2 3	0 70	2 9
Other sanitation	6,923	0 05	0 3	0 06	0 3	0 18	0 7
Kansas City, Kans.	36,214	0 29	1 6	0 48	2 2	0 89	3 8
Sewers and sewage disposal	2,761	0 02	0 1	0 06	0 2	0 10	0 4
Street cleaning	7,388	0 06	0 3	0 16	0 8	0 25	1 1
Refuse collection and disposal	25,665	0 21	1 2	0 21	1 0	0 45	1 9
Other sanitation	400	[b]	[a]	0 05	0 2	0 09	0 4
Ft. Wayne, Ind.	141,031	1 17	5 9	1 19	5 5	1 27	5 1
Sewers and sewage disposal	25,998	0 22	1 1	0 19	0 9	0 22	0 9
Street cleaning	35,492	0 30	1 5	0 32	1 5	0 52	2 1
Refuse collection and disposal	67,785	0 56	2 8	0 56	2 6	0 43	1 7
Other sanitation	11,756	0 09	0 5	0 12	0 5	0 10	0 4
Camden, N. J.	153,518	1 29	4 2	0 91	2 8	1 93	5 7
Sewers and sewage disposal	42,931	0 36	1 2	0 24	0 7	0 22	0 7
Street cleaning	33,991	0 29	0 9	0 19	0 6	0 85	2 5
Refuse collection and disposal	74,639	0 63	2 0	0 47	1 4	0 81	2 4
Other sanitation	1,957	0 01	0 1	0 01	0 1	0 05	0 1
Erie, Pa.	182,920	1 55	6 3	1 39	5 4	1 32	5 2
Sewers and sewage disposal	34,362	0 29	1 2	0 27	1 0	0 26	1 0
Street cleaning	67,302	0 57	2 3	0 46	1 8	0 35	1 4
Refuse collection and disposal	80,946	0 69	2 8	0 62	2 4	0 69	2 7
Other sanitation	310	[b]	[a]	0 04	0 2	0 02	0 1
Elizabeth, N. J.	195,286	1 66	4 5	1 95	4 9	2 35	7 5
Sewers and sewage disposal	34,684	0 29	0 8	0 28	0 7	0 35	1 1
Street cleaning	95,051	0 81	2 2	1 05	2 6	1 21	3 8
Refuse collection and disposal	58,493	0 50	1 4	0 59	1 5	0 74	2 4
Other sanitation	7,058	0 06	0 1	0 03	0 1	0 05	0 2
Wichita, Kans.	108,859	0 93	3 9	0 90	3 8	1 17	4 6
Sewers and sewage disposal	32,502	0 28	1 1	0 24	1 0	0 16	0 6
Street cleaning	27,447	0 23	1 0	0 24	1 0	0 39	1 5
Refuse collection and disposal	41,126	0 35	1 5	0 36	1 5	0 50	2 0
Other sanitation	7,784	0 07	0 3	0 06	0 3	0 12	0 5
Spokane, Wash.	134,878	1 16	5 0	1 33	5 3	1 78	6 0
Sewers and sewage disposal	24,597	0 21	0 9	0 22	0 9	0 23	0 8
Street cleaning	46,321	0 40	1 7	0 57	2 3	0 68	2 3
Refuse collection and disposal	54,053	0 46	2 0	0 45	1 8	0 77	2 6
Other sanitation	9,907	0 09	0 4	0 09	0 3	0 10	0 3
Fall River, Mass.	82,617	0 72	2 1	0 68	2 0	1 90	4 3
Sewers and sewage disposal	13,441	0 12	0 3	0 15	0 4	0 31	0 7
Street cleaning	6,297	0 06	0 2	0 05	0 1	0 42	0 9
Refuse collection and disposal	55,532	0 48	1 4	0 42	1 3	1 10	2 5
Other sanitation	7,347	0 06	0 2	0 06	0 2	0 07	0 2
Cambridge, Mass.	521,346	4 56	9 0	4 92	9 6	4 70	10 7
Sewers and sewage disposal	82,492	0 72	1 4	0 68	1 3	0 90	2 0
Street cleaning	131,118	1 15	2 3	1 19	2 3	0 91	2 1
Refuse collection and disposal	296,661	2 59	5 1	2 95	5 8	2 80	6 4
Other sanitation	11,075	0 10	0 2	0 10	0 2	0 09	0 2
New Bedford, Mass.	224,763	2 00	5 4	2 08	5 5	3 38	7 8
Sewers and sewage disposal	40,769	0 36	1 0	0 39	1 0	0 78	1 8
Street cleaning	23,130	0 21	0 6	0 27	0 7	0 66	1 5
Refuse collection and disposal	142,904	1 27	3 4	1 27	3 4	1 75	4 0
Other sanitation	17,960	0 16	0 4	0 15	0 4	0 19	0 5
Reading, Pa.	149,554	1 34	4 9	1 42	5 1	2 09	8 7
Sewers and sewage disposal	46,492	0 42	1 5	0 61	2 2	0 59	2 4
Street cleaning	42,355	0 38	1 4	0 31	1 1	0 64	2 7
Refuse collection and disposal	48,518	0 43	1 6	0 40	1 4	0 72	3 0
Other sanitation	12,189	0 11	0 4	0 10	0 4	0 14	0 6
Knoxville, Tenn.	93,965	0 85	4 1	0 85	3 8	1 43	6 0
Sewers and sewage disposal	12,238	0 11	0 5	0 11	0 5	0 22	0 9
Street cleaning	23,528	0 21	1 0	0 20	0 9	0 36	1 5
Refuse collection and disposal	51,268	0 47	2 3	0 47	2 1	0 78	3 3
Other sanitation	6,931	0 06	0 3	0 07	0 3	0 07	0 3
Peoria, Ill.	172,424	1 57	6 3	2 18	8 7	1 43	6 1
Sewers and sewage disposal	83,084	0 76	3 0	1 13	4 5	0 16	0 7
Street cleaning	2,483	0 02	0 1	0 25	1 0	0 53	2 3
Refuse collection and disposal	84,011	0 77	3 1	0 78	3 1	0 71	3 0
Other sanitation	2,846	0 02	0 1	0 02	0 1	0 03	0 1

Mathieson Chemicals do a dependable job at Allentown, Pa.



WATER DEPARTMENT
W. R. SCHNABEL, C. E. SUPT. & ENGINEER

September 26,1936

The Mathieson Alkali Works,Inc..
60 East 42nd St..
New York, N. Y.

Gentlemen:

We are pleased to reply to your recent inquiry regarding our use of and satisfaction with your products.

It may interest you to know that we have been users of your liquid chlorine for over twenty years. In this time we have been well served and have not been subjected to any inconvenience from dirty or sticky cylinder valves which we consider a distinct advantage.

We have also been users of HTH since its first introduction several years ago. We have found this product particularly useful in sterilizing our water mains up to 12 inches diameter.

In addition we have used HTH in our public swimming pools for sanitary purposes in foot baths and for cleaning up around the pools and as an emergency source of chlorine in the pools.

In the large,36 inch mains,we have found it economical to sterilize by adding liquid chlrine directly to the water from a cylinder transported to the job in a rig of our own make-up.

We might add in closing that we are small users of your light soda ash and have found this product as uniformly satisfactory in quality and from a service viewpoint as our other purcahses from you.

Yours very truly,

Supt. & Engineer

WRS:B

FROM the City of Allentown, Pa., comes this further evidence that water works men appreciate quality chemicals and dependable service—and that they select their sources of supply accordingly. Certainly Mr. Schnabel, whose letter is reproduced at the left, has shown his appreciation of these things in a very tangible way by using Mathieson Chlorine for over twenty years. Moreover, when he has needed other chemicals made by Mathieson, he has looked for—and found—the same high quality and prompt service that he had long come to associate with the name Mathieson.

The* MATHIESON ALKALI WORKS *(Inc.)
60 East 42nd Street **New York, N. Y.**

Soda Ash . . . Liquid Chlorine . . . Bicarbonate of Soda . . . HTH and HTH-15 . . . Caustic Soda . . . Bleaching Powder . . . Ammonia, Anhydrous and Aqua . . . PH-Plus (Fused Alkali) . . . Solid Carbon Dioxide

Sewage Notes

(Continued)

know how much we appreciate the way you have eliminated the smell at your place. We haven't been bothered for months! And another thing, we folks in the neighborhood have decided to make our own yards look as nice as the grounds at the sewage plant. You have certainly showed us how to do it!"

Our puzzled friend, O. P. Rator, hung up dazedly and noticed Farmer Jones entering the grounds.

"Howdy, O. P.," boomed Jones. "Jest stopped in to tell ye how nice the crick's lookin' these days. I ain't seen her in better shape sence '92! The local Farmers' Grange is givin' a blow-out fer ye next Thursday night to show our appreciation. Kin ye come?"

Farmer Jones left Rator in a near coma.

Of all times for the whole City Council, headed by the Mayor, to come down for an inspection!

The salutations over, O. P. Rator guided his employers through the plant, all the time wondering as to the purpose of this unusual visit. However, nothing but praise and commendation was showered on him, it appearing that everything was perfectly to the satisfaction of all.

As the group was preparing to leave, the Mayor said, "O. P., you're doing a mighty fine job out here and you deserve our thanks. This plant has never before operated so well at such low cost. To show our appreciation we are giving you a 20 per cent increase in salary at the council meeting tonight and will hire a helper for you beginning the first of the month!"

O. P. Rator felt faint ————.

The surgeon stood by as O. P. Rator stirred and opened his eyes. "That appendix was in bad shape, Mr. Rator, but the operation was a complete success and you'll be up and around in about three weeks," he said.

Rator peacefully closed his eyes again and smiled. He whispered weakly, "Doc, put that apron back on and think of something else to take out. Anything you please, Doc—just so you give me *more* of that same anesthetic!"

Peak Flows of Sewage at Long Island Plants

A STUDY of the existing sewage-treatment plants in Nassau County, Long Island, N. Y., made by the Nassau County Sanitation Commission, shows that during peak flows the contribution of sewage per capita is at the rate of approximately 146 gallons per day, with an average flow estimated at 100 gallons per day. These county plants were designed to take care of the maximum flow rather than the average flow, since it is believed that peak loads of several hours' duration might result in a rather poor effluent for discharge into tidal waters and it is the aim to discharge only a highly clarified end product at all times.

There are at the present time in Nassau County sixteen sewage-treatment plants in operation, one of which, in Red Springs Colony near Glen Cove, is a private plant. The others listed in the table below are either village or special district plants.

NASSAU COUNTY, N. Y., SEWAGE PLANTS, 1935

	Peak Sewage Flow	Population Connected	Peak Flow Per Capita
Hempstead	1,600,000	12,000 to 13,000	128 gal.
Garden City	1,150,000	9,000	128
Long Beach	2,000,000	8,000	250
Freeport	1,300,000	13,000	100
Rockville Centre	2,600,000	17,000 to 18,000	148
Port Washington	900,000	10,000	90
Mineola	778,000	7,780	100
Glen Cove	2,500,000	10,000	250
	12,828,000	87,780	146 Average

Sanitation Services

(Continued from page 17)

GROUP III.—CITIES OF 100,000 TO 300,000 (Continued)

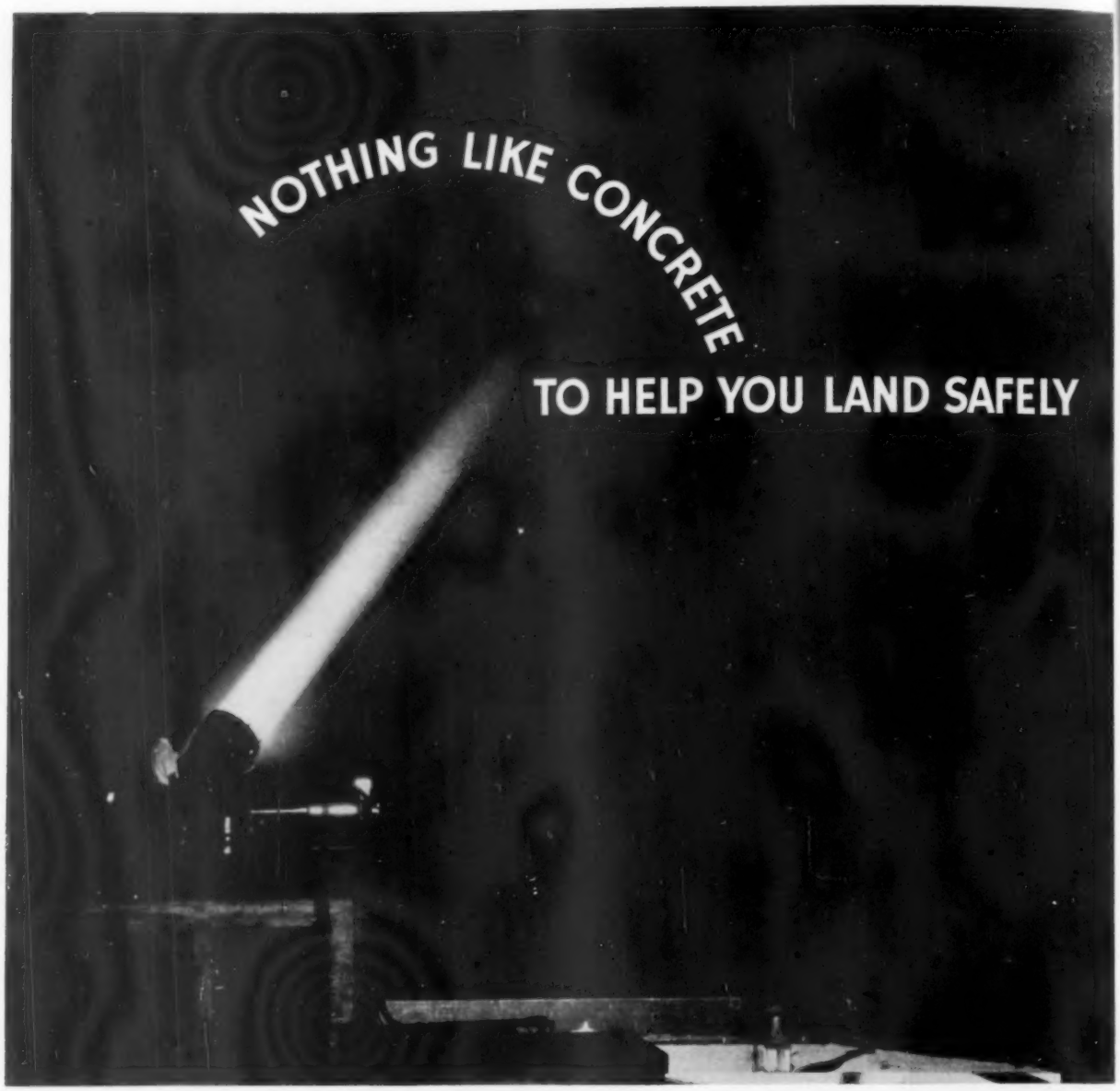
	1934			1933		1926	
	Total	Per Capita	Per Cent of All General Departments	Per Capita	Per Cent of All General Departments	Per Capita	Per Cent of All General Departments
SOUTH BEND, IND.	62,486	0.57	2.8	0.41	2.0	0.96	3.5
Sewers and sewage disposal	2,423	0.02	0.1	0.01	[2]	0.12	0.4
Street cleaning	15,108	0.14	0.7	....	....	0.46	1.7
Refuse collection and disposal	43,455	0.40	1.9	0.39	1.9	0.37	1.4
Other sanitation	1,500	0.01	0.1	0.01	0.1	0.01	[2]
TACOMA, WASH.	164,130	1.52	5.8	1.66	6.2	0.92	3.2
Sewers and sewage disposal	27,724	0.26	1.0	0.34	1.3	0.24	0.8
Street cleaning	29,167	0.27	1.0	0.34	1.2	[10] 0.55	[11] 1.9
Refuse collection and disposal	101,316	0.94	3.6	0.93	3.5	[2]	[2]
Other sanitation	5,923	0.05	0.2	0.05	0.2	0.13	0.5
MIAMI, FLA.	221,301	2.05	7.0	2.12	7.6	6.29	12.1
Sewers and sewage disposal	51,675	0.48	1.6	0.44	1.6	1.14	2.2
Street cleaning	31,693	0.29	1.0	0.29	1.0	1.10	2.1
Refuse collection and disposal	114,864	1.06	3.6	1.15	4.1	3.76	7.2
Other sanitation	23,069	0.22	0.8	0.24	0.9	0.29	0.6
GARY, IND.	87,092	0.81	3.5	0.55	2.3	1.16	3.8
Sewers and sewage disposal	27,091	0.25	1.1	0.21	0.8	0.21	0.7
Street cleaning	28,660	0.27	1.1	....	....	0.74	2.4
Refuse collection and disposal	31,341	0.29	1.3	0.32	1.4	0.21	0.7
Other sanitation	....	....	....	0.02	0.1	....	....
CANTON, OHIO	91,991	0.86	3.6	0.77	3.5	1.20	4.9
Sewers and sewage disposal	35,795	0.33	1.4	0.33	1.5	0.47	1.9
Street cleaning	14,734	0.14	0.6	0.15	0.7	0.15	0.6
Refuse collection and disposal	39,681	0.37	1.5	0.27	1.2	0.54	2.2
Other sanitation	1,781	0.02	0.1	0.02	0.1	0.04	0.2
WILMINGTON, DEL.	243,628	2.29	8.3	2.31	7.9	2.55	9.8
Sewers and sewage disposal	17,088	0.16	0.6	0.16	0.5	0.17	0.7
Street cleaning	51,517	0.49	1.8	0.51	1.8	0.71	2.7
Refuse collection and disposal	166,299	1.56	5.6	1.55	5.3	1.59	6.1
Other sanitation	8,724	0.08	0.3	0.09	0.3	0.08	0.3
TAMPA, FLA.	260,551	2.45	11.0	2.55	11.0	3.70	11.0
Sewers and sewage disposal	24,473	0.23	1.0	0.25	1.1	0.39	1.2
Street cleaning	53,766	0.51	2.3	0.48	2.1	0.46	1.3
Refuse collection and disposal	171,812	1.61	7.2	1.72	7.4	2.56	7.6
Other sanitation	10,500	0.10	0.5	0.10	0.4	0.29	0.9
SOMERVILLE, MASS.	311,168	2.94	7.1	2.89	7.6	2.97	10.3
Sewers and sewage disposal	68,896	0.65	1.6	0.67	1.8	0.69	2.4
Street cleaning	28,801	0.27	0.7	0.30	0.8	0.25	0.9
Refuse collection and disposal	212,845	2.01	4.8	1.91	5.0	2.03	7.0
Other sanitation	626	0.01	[3]	0.01	[3]	[3]	[3]
EL PASO, TEXAS	69,597	0.66	4.5	0.77	4.6	1.68	7.5
Sewers and sewage disposal	19,818	0.19	1.3	0.19	1.2	0.27	1.2
Street cleaning	10,496	0.10	0.7	0.13	0.8	0.55	2.5
Refuse collection and disposal	35,942	0.34	2.3	0.41	2.4	0.74	3.3
Other sanitation	3,341	0.03	0.2	0.04	0.2	0.12	0.5
EVANSVILLE, IND.	67,887	0.65	3.2	0.60	2.9	0.92	4.2
Sewers and sewage disposal	13,189	0.13	0.6	0.10	0.5	0.12	0.5
Street cleaning	25,091	0.24	1.2	0.23	1.1	0.39	1.8
Refuse collection and disposal	27,545	0.26	1.3	0.25	1.2	0.38	1.8
Other sanitation	2,062	0.02	0.1	0.02	0.1	0.03	0.1
LYNN, MASS.	266,124	2.59	5.7	2.65	5.8	2.47	7.3
Sewers and sewage disposal	78,630	0.77	1.7	0.94	2.1	0.43	1.3
Street cleaning	14,455	0.14	0.3	0.14	0.3	0.29	0.9
Refuse collection and disposal	161,511	1.57	3.5	1.47	3.2	1.68	4.9
Other sanitation	11,528	0.11	0.2	0.10	0.2	0.07	0.2
UTICA, N. Y.	226,893	2.21	4.7	2.30	5.1	3.03	8.7
Sewers and sewage disposal	8,431	0.08	0.2	0.12	0.2	0.13	0.4
Street cleaning	64,640	0.63	1.3	0.63	1.4	1.15	3.3
Refuse collection and disposal	143,925	1.40	3.0	1.43	3.2	1.62	4.7
Other sanitation	9,897	0.10	0.2	0.12	0.3	0.13	0.3
DULUTH, MINN.	56,550	0.55	1.8	0.65	2.2	1.03	3.6
Sewers and sewage disposal	28,065	0.28	0.9	0.24	0.8	0.37	1.1
Street cleaning	9,606	0.09	0.3	0.19	0.6	0.35	1.0
Refuse collection and disposal	9,091	0.09	0.3	0.09	0.3	0.14	0.4
Other sanitation	9,788	0.09	0.3	0.13	0.5	0.17	0.5
WATERBURY, CONN.	217,764	2.15	4.7	1.49	3.5	1.78	4.2
Sewers and sewage disposal	114,880	1.14	2.5	0.59	1.4	0.32	0.8
Street cleaning	53,075	0.52	1.1	0.45	1.1	0.88	2.1
Refuse collection and disposal	42,565	0.42	0.9	0.39	0.9	0.47	1.1
Other sanitation	7,244	0.07	0.2	0.06	0.1	0.11	0.2
LOWELL, MASS.	199,678	1.99	5.0	1.70	4.3	2.47	6.1
Sewers and sewage disposal	34,773	0.35	0.9	0.23	0.6	0.24	0.6
Street cleaning	34,005	0.34	0.8	0.29	0.7	0.52	1.3
Refuse collection and disposal	118,545	1.18	3.0	1.07	2.7	1.59	3.9
Other sanitation	12,355	0.12	0.3	0.11	0.3	0.12	0.3

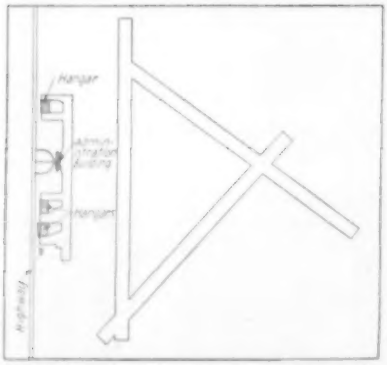
[1] Includes refuse collection and disposal.
[2] Included with street cleaning.
[3] Less than 1–20 of 1 per cent.
[4] Percentage of county transactions not included.
[5] Less than ½ of 1 cent.

COST OF EXISTING SEWAGE-DISPOSAL PLANT

	Actual Cap. MGD	Plant Cost or Estimated Cost	Plant Site Acres	Land Cost or Fair Value	Total Cost	Cost per MGD Capacity
Freeport	.5	$140,817	5	$25,000	$165,817	$330,634
Rockville Centre	2.0	551,000	19	129,000	680,000	340,000
Carden City	.9	100,000†	12	72,000	172,000	191,300
Hempstead	2.0	400,000†	40	240,000*	640,000	320,000
Cedarhurst	1.4	120,000	5	25,000*	145,000	103,500
Lawrence	1.0	36,817	5	30,431	67,248	67,248
Long Beach	1.5	200,000†	3†	18,000*	218,000	145,300
Atlantic Beach	.7	205,000	1.65	10,000*	215,000	307,500
Great Neck Village	1.2	203,500	2	45,000	248,500	207,000
Great Neck Sewer District	1.8	170,000	3.5	35,000*	205,000	113,800
Belgrave Sewer District	1.2	124,000	2.0	15,000	139,000	115,750
Port Washington Sewer District	1.8	179,000	4.0	28,000	207,000	115,000
Mineola	1.0	130,530	12.5	77,225*	207,764	207,764
Oyster Bay Sewer District	.9	111,627	7.3	30,000*	141,627	157,500
Glen Cove	.8	121,450	5†	30,000	151,450	189,800
	18.7	$2,793,750	126.95	$809,656	$3,603,406	$2,912,096

Average size plant 1.25 million gallons daily. Average land requirement 8.46 acres. Average cost of land per acre $6,380. Average cost plant and site—$194,140 per MGD.
Note: † Estimated. *Fair value.





Wold-Chamberlain Airport, Minneapolis, showing plan of concrete runways. Runways 150 ft. wide and 3,000, 3,000 and 3,500 ft. long, with 6-in. slab cast in 20-ft. strips thickened to 9 in. at edges. WPA project under sponsorship and direction of Board of Park Commissioners, Minneapolis. C. A. Bossen, Supt., A. E. Berthe, Park Engineer.

MINNEAPOLIS has just rededicated its Wold-Chamberlain Airport, to mark the completion of new concrete runways which make this airport one of the country's finest—and safest!

Pilots can see light-colored concrete runways better, night or day. Concrete provides a smooth, dependable surface to land on, with ample traction for tires—no excessive crown, no puddles of standing water, no ruts or bumps, no loose particles to endanger propeller, passenger or plane.

Concrete's cleanliness and safety invite patronage—puts your airport on a 365-days-a-year basis.

With all its advantages, concrete is moderate in first cost and actually costs less over a period of years. Runways can be designed economically for given wheel loads and landing impacts. The ample safety factor and durability mean long service life with extremely low maintenance expense. Its light grey matte surface permits adequate lighting at lowest cost.

Specify concrete for your runways and aprons. Let us send Information Sheets and the booklet, *"Concrete Makes a Modern Airport."*

PORTLAND CEMENT ASSOCIATION

Dept. A12-4, 33 West Grand Avenue, Chicago, Illinois

Mention THE AMERICAN CITY—it helps.

Public Safety

Radio Car Collects Tulsa's Stray Dogs

CRUISING the streets of the city daily, this radio-equipped V-8 unit is keeping Tulsa rid of stray animals. Residents reporting a stray dog are often surprised to see this unit arrive so quickly.

More Cars, Fewer Accidents in Massachusetts

SIX out of the largest nine cities in Massachusetts reported a marked reduction in the number of persons injured in motor-vehicle accidents in September. This report was in connection with the Inter-Community Contest sponsored by the Massachusetts Chiefs of Police Association and supervised by the Massachusetts Safety Council. Massachusetts is more than holding her own in the battle to reduce accidents. With 33,000 more cars on the highway than one year ago, and 340 million more gallons of gas consumed, there has been an increase of only one fatality since the first of the year and there were 2,809 fewer injuries. The average for the country is one death for about 750 cars registered.

Police Boxes and Radio

WE are installing 15 outside police signal boxes. I am strongly in favor of two-way radio. These two units working in conjunction with each other bring the modern police department to a standard efficiency.

THOMAS I. CROWLEY,
Chief of Police, Bangor, Maine.

Young Criminals

"SEVENTEEN out of every 100 persons arrested during the first nine months of 1936 were under 21 years of age," writes J. Edgar Hoover. "Until the last half of 1935, arrests of individuals 19 years of age outnumbered those for any other single age group. The arrest records received since June, 1935, reveal a shift in the majority of individuals arrested, to the ages of 21, 22 and 23 years. Whether this is attributable to the 19-year-old age group continuing its criminal tendencies and becoming second offenders, to the effectiveness of the concerted drive against crime, or to an improvement of economic factors, is a matter for speculation. The trend, however, is being noted and observed, and by future comparison it should be possible to ascertain its significance and to determine if it is of a permanent or temporary character."

New Jersey's Deaths Down 16 Per Cent

A YEAR ago, as Governor of New Jersey, I voiced at Louisville a challenge to the states — to reduce deaths from traffic accidents by 35 per cent within five years. New Jersey, in the first of these five years, has reduced deaths from accident upon her highways by 16 per cent; in one year we are nearly half-way to the goal.

This does not mean that we have attained safety. It means only that we are a little less careless—a little less wasteful, a little less wanton.

But it is a gain. There are 91 more persons alive in the world today than there would have been if we had killed with as reckless a hand as we killed a year ago.

—Governor Harold G. Hoffmann in his address of welcome to the 25th National Safety Congress.

New Trucks Are Cheaper Than Accidents

THE regulations recently proposed by the Motor Carrier Bureau of the Interstate Commerce Commission, while affecting only trucks and buses used in interstate commerce, may be the forerunner to a program affecting all motor vehicles.

In too many states, regulation is still in the "two-wheel brake" stage. Where attempts at modernization have been made, these have sometimes consisted of merely tacking confusing legislation onto an obsolete code. A truck or bus built of as many conflicting elements as are found in the traffic laws of our 48 states wouldn't work. It is not surprising that the laws do not work, either, in promoting the one thing they are chiefly intended to promote—highway safety.

In the past two years, White has devoted the major portion of its large research expenditures to developing engines responsive enough to make the truck flexible in modern traffic: four-wheel hydraulic brakes, power-booster operated; automatic air-conditioned and fume-proof cabs; easy steering and good road stability.

Because they have found it to be economically unsound to try to operate obsolete trucks under today's traffic conditions, more and more progressive operators are replacing them with safe modern trucks. *Truck and bus operators fully realize that nothing can be as expensive as an accident, and the safest vehicles they can buy are the cheapest insurance against them.* Out of the 3,500,000 trucks registered, nearly one-third were built before the development of many safety features now recognized as essential.

ROBERT F. BLACK,
President, The White Motor Co.

Don't Hit Pupils

"LET us not make the school bell sound the knell of child lives," said Thomas P. Henry, President of the A.A.A. "I call on the sportsmanship of all driving commuters whose daily route carries them past schools everywhere in the nation. Thousands of children who are going to school for the first time are not familiar with the hazards of the highway. It is up to the men and women who drive automobiles to be ever on the alert for these unsuspecting youngsters."

HERE ARE THE SIX TWO-WAY RADIO-EQUIPPED FORD V-8 SEDANS OF THE CITY OF HAMILTON, OHIO
Hamilton's new police station in the background. The automobile antennae are seen on the back of each car

HEIL

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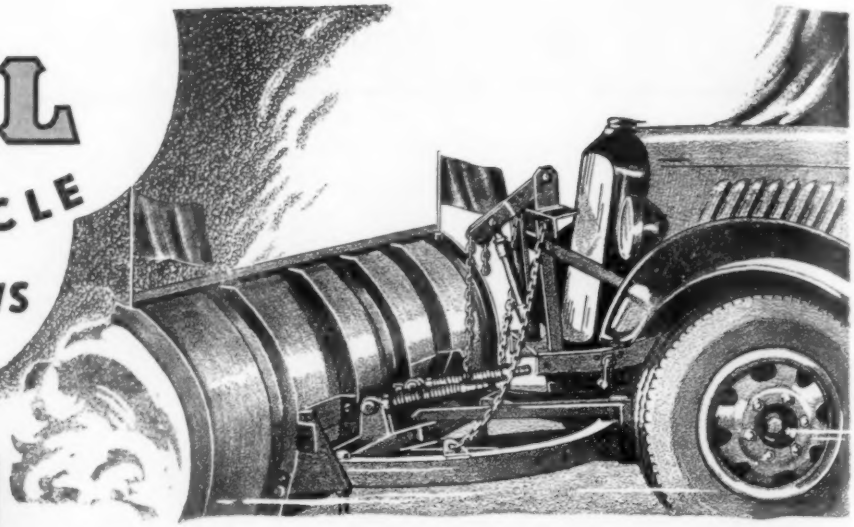

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DECEMBER, 1936

Vol. LI, No. 12

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

Thawing Water Service Lines Free of Charge

Results of the Experiences and Studies of the Indianapolis Water Company Last Winter

By W. C. MABEE
Chief Engineer, Indianapolis Water Company, Indianapolis, Ind.

THE extreme cold occurring in January and February, 1936, and the extreme heat and severe drought in July and August, will be the causes of many interesting, sometimes sad, stories. I will attempt to deal only with the first of these extremes, which I shall call the Great Freeze of 1936.

Last February was the coldest that Indianapolis has experienced during the 65 years that records have been kept by the local U. S. Weather Bureau. Continuous subnormal temperatures, unprecedented in Indianapolis, caused frost to penetrate the ground to the maximum depth of 55 inches, but in most instances from 42 to 48 inches. Nearly 2,000, or 2.7 per cent, of all water service lines in Indianapolis were frozen. These individual lines were laid too shallow in the first instance, or the earth cover had been partially removed. Thus they were vulnerable to deep frost.

The Indianapolis Water Co. requires an earth cover of at least 4 feet 6 inches, which would adequately protect water pipes from freezing in central Indiana climate, even during the extremes of low temperature experienced in the winter of 1936.

Ordinarily, in Indianapolis, if a customer's water service pipe freezes, he employs a plumber to thaw it. At the beginning of the freeze, and for a period of a week or so, the situation was kept in hand by the city's plumbers. Then came a flood of telephone calls—customers in distress, no water, no plumber available! What could the company do?

Company Decides to Do the Thawing

Realizing that the situation was getting out of control, the Indianapolis Water Co. on February 13 met the ever-increasing emergency by taking over the task of thawing services free of charge for its troubled customers. All available electric thawing equipment was set to work, and long-distance calls were sent out by the company and the leading plumbers for additional thawing equipment. In a few days fourteen electric arc-welding machines were at work thawing service pipes.

In a situation of this kind the telephone was most valuable. Calls were received, names and addresses recorded, and the work dispatched to the fourteen crews by telephone. Day and night for weeks the appeals for help came pouring in. Each case was urgent, with the customer expecting instant relief as though his was the only frozen service to be thawed. Day and night the company employees labored, taking but slight time out to rest, and doing their utmost to relieve a particularly tense situation. Gradually the situation became easier as customers whose services had frozen realized the importance of permitting their faucets to run continually to help prevent freezing. Many customers, even after their lines had been thawed, neglected this precaution, and it became necessary to repeat the thawing of their services several times.

Technique of Thawing

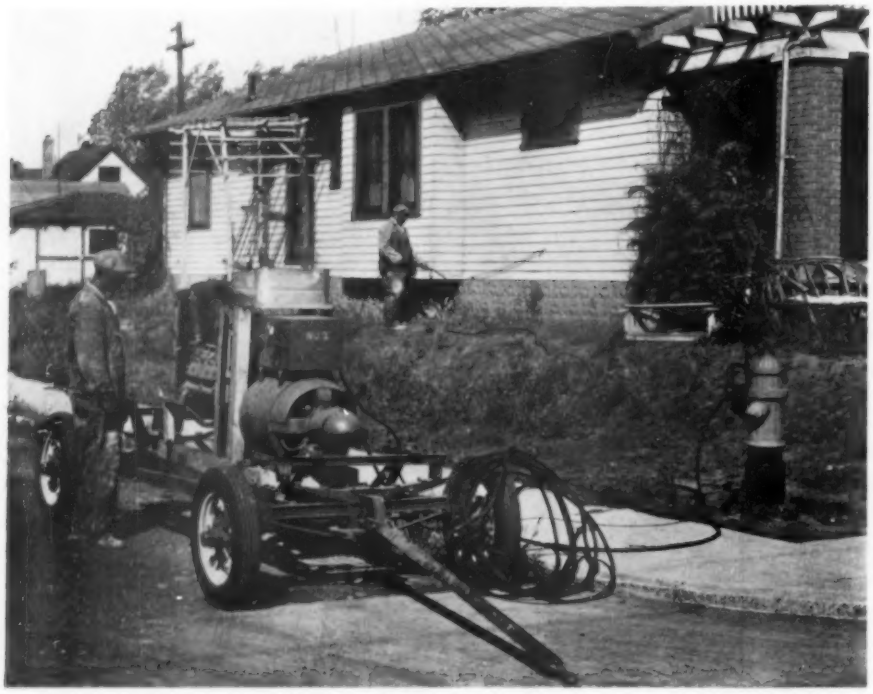
At the outset little of the technique of electric thawing was known to the plumbers of Indianapolis. Experience had to be gained by the trial-and-error method. Practically all the thawing was done with gasoline-motor-driven arc-welding generator sets, making connections to the service outside the meter and either at a nearby hydrant or at the nearest curb stop of an adjoining property. These sets varied in capacity, but it was found that a generator operating on 40 volts, delivering 300 amperes, was quite effective.

The time required to thaw an individual service varied from five minutes to an hour or more. Usually, however, from fifteen to twenty minutes was required after all connections were made.

It was found convenient to clamp the terminal on the

water pipe where it enters the basement, after first disconnecting the union below the meter and swinging the latter to one side. As a precautionary measure, it was found advisable to disconnect all grounding wires beyond the point of application of the terminal. Otherwise electrical devices in the home might have been injured. The other terminal was usually clamped on the nearest hydrant, or curb stop key, or to the service pipe in an adjoining house.

After a few days' experience the work of thawing went along faster, although some services proved to be very obstinate. Each crew would thaw from ten to fifteen cases a day, although one crew averaged eight while another thawed a maximum of twenty-five cases. At the peak of the trouble there was a lag of five or six days in caring for complaints. A few crews worked as much as eighteen hours a day, but the usual time was twelve hours.



ONE OF THE MACHINES USED BY THE INDIANAPOLIS WATER COMPANY FOR THAWING CUSTOMERS' SERVICES

An "Unusual" Winter

Ordinarily, freezing weather in Indianapolis begins about December 18, when the mean temperature is 32° F. From then to January 28 it drops to 28° F., then gradually returns to 32° F. about February 18. In other words, in an average winter we may expect two months of freezing weather, and during that time we would accumulate less than 200 degrees of mean daily temperature below freezing. Contrast that with the winter of 1936, when the accumulation was 885 degrees, and you have the reason for the unprecedented amount of trouble with frozen services. It should be understood that the mean daily temperature as reported by the Weather Bureau is the average of the high and low temperature for the day.

Reports of frozen services began about February 1, when 500 degrees of mean daily temperature below freezing had accumulated. The trouble started sixteen days after the beginning of the second cold wave of the winter. This cold wave followed a period of thawing weather lasting nearly three weeks in January (the so-called January thaw), as shown on the chart. Then the memorable cold wave struck hard on January 19 and continued for 35 days, to February 22, with temperatures 37 degrees below normal on January 23, when the temperature reached a minimum of 18 degrees below zero.

Eighteen days after the cold had subsided, complaints from customers with frozen services were still being received. Thawing of services with the electric arc-welding outfits went on at a rapid rate for several weeks, tapering off with scattered cases at the end of the period, toward the middle of March.

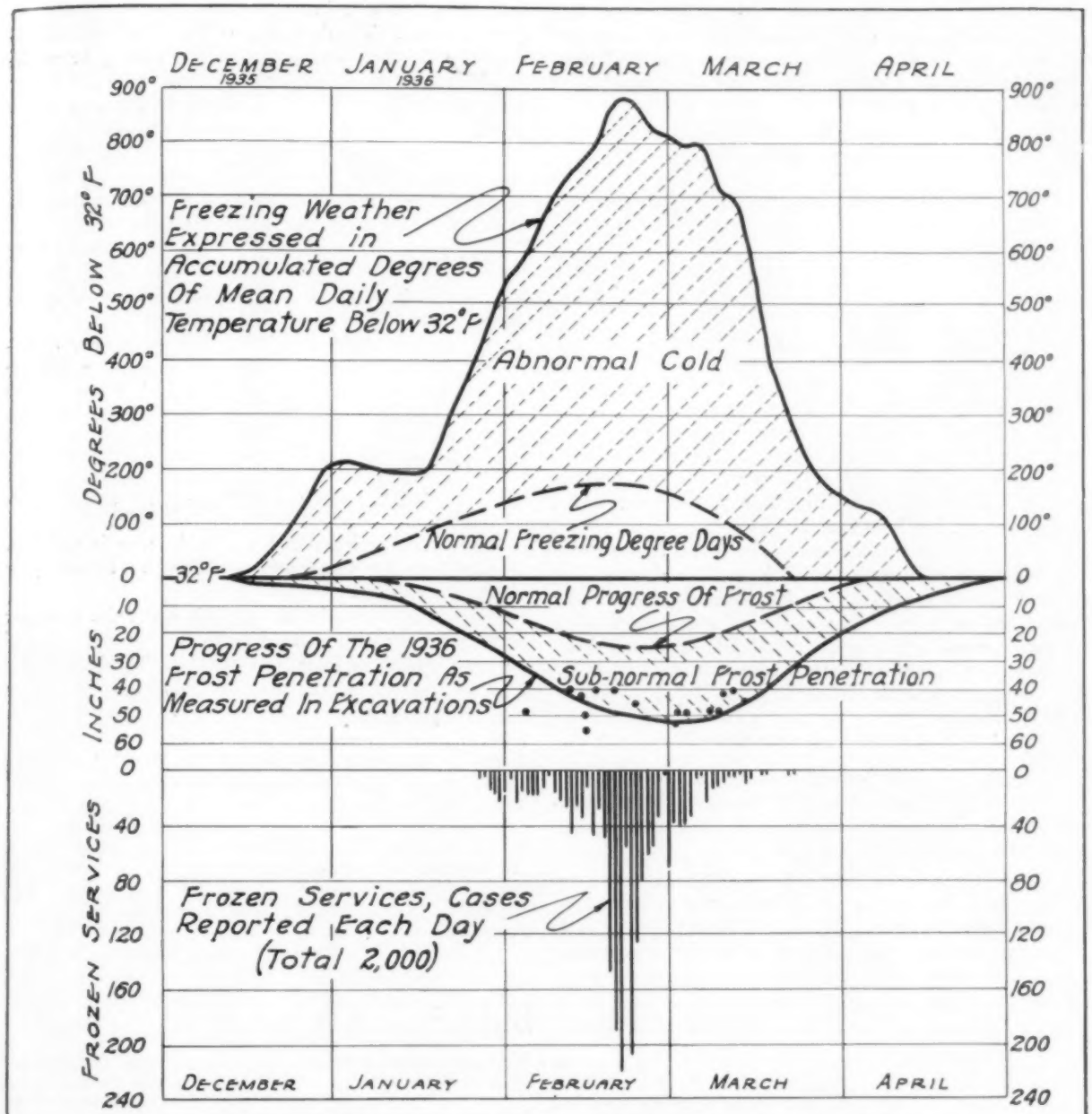
A portion of the freeze-ups may be attributed to inadequate earth cover over the pipes, for many instances were found where service pipes were too shallow. If water had not been kept moving in mains and services, more of them would have frozen.

Care of Service Pipes

Although water service pipes in Indianapolis are the property of the owner, they are laid in accordance with certain regulations established by the Water Company. Wherever these regulations as to depth were followed, the trouble from freezing was negligible.

The responsibility, therefore, for maintaining their own service lines properly belongs to the owners. In this instance, however, because of the magnitude of the job and the desire upon the part of the company to help its customers in a crisis, it took over the job without compensation other than the customer's good-will.

Frozen water service troubles were widespread over the frost zones of the whole country, reaching as far south as Louisville, Ky. The Weather Bureau reported lower than normal winter temperatures in all parts of the United States except the extreme Southwest. Water-works journals gave much space to publishing cold-weather experiences of superintendents of water plants during the past



EXTREME COLD WEATHER IN 1936

FROST PENETRATION AND FROZEN SERVICES

INDIANAPOLIS INDIANA

Study By: W.C. Mabee
Chief Engr.-Indianapolis Water Co.

winter. Engineering societies discussed the matter at length, with especial emphasis on the method employed for thawing frozen mains and services.

Commenting on the situation in Indianapolis in one of the engineering journals, H. S. Morse, Manager of the Indianapolis Water Co., said: "We had practically no cases of frozen hydrants. During the cold weather we had a close follow-up of hydrants that we thought would cause trouble. In a few instances where streets had been graded subsequent to the original installation of mains, some mains were found frozen. About 2,000, or 2.7 per cent, of all private service lines were frozen. We had no trouble with tanks, as the levels fluctuated. The number of frozen meters and services was far greater than for any other winter in the company's history. We used portable electric generator sets to thaw services. Steam was used

for thawing mains with Leadite joints. The temperature of the water pumped was 33°. The frost depth averaged more than 44 inches, with a maximum depth of 55 inches. The cold-weather troubles lasted for more than seven consecutive weeks."

That story may be multiplied many times as the experience of other municipalities last winter.

What Was Learned by Experience

What may we learn from these experiences that will suggest remedies tending to fortify us against future cold-weather trouble?

Among other things we learn, first, that it is unwise to permit services to be laid at depths less than the depth to which frost penetrates; and, to insure compliance with rules respecting the proper depth of installations, inspectors should not deviate from the rule.

Second, that mains should be laid with adequate cover to protect them from freezing, and that care should be exercised in laying mains in streets not permanently graded, so that the mains will have this adequate cover after the street has been brought to grade.

Third, since frost penetrates in proportion to the severity and cumulative progress of the cold, and also since there is a time-lag between freezing-degree days and frozen mains and services, it is possible to anticipate thawing demands several weeks before complaints occur and thereby be able to make the necessary preparations to take care of the trouble when it arrives.

Frost Penetration

The data which we were able to collect on the subject of frost penetration were meager; however, they are submitted for what they are worth. The dots on the accompanying chart represent frost line.

A conviction is held by some that frost penetrates deeper with the coming of warmer weather and as a natural consequence of the thawing temperature. It is true that frost goes deeper even after the temperature moderates, but not, in my opinion, for the reason expressed above. The deepening of the frost line is attributable to the fact that the frozen ground may be considerably colder than the temperature at which ice forms; consequently this lower-than-freezing temperature of the ground is dissipated only by extending the frost line downward to absorb more heat from the warmer layers of soil beneath it. This process continues with thawing weather above ground until the frozen ground becomes stabilized at 32° F., above which the frost disappears.

An attempt has been made in this study to correlate temperature with frost penetration as reflected by the first appearance, intensity, and extent of frozen services and mains. This is shown graphically on the chart.

In general, it may be stated as a result of our experiences that frost penetrated about two inches a day for the first ten days of severe cold, one inch a day for the following eighteen days, one-half inch a day for the next twenty-two days, then gradually absorbed heat until it disappeared.

Warnings to Customers

It has been said that a word to the wise is sufficient. Prepare now for the winter of 1936-37. Protect your meters and services.

It is the practice of the Indianapolis Water Co. each year as winter approaches to send to its customers a notice of approaching danger from frost troubles. The following is typical:

"Get ready for a cold snap.

"Look out for freezing weather!

"Winter is coming—and with it frozen and burst water pipes, fixtures, and water meters. You may save yourself considerable expense and annoyance by timely preparation.

"Close basement windows. Protect pipes in the basement against draughts. See that the water service shut-off valve in the basement is in good working condition and not covered up. It is not necessary that your water pipes freeze. Take reasonable precautions and enjoy continuous and uninterrupted service.

INDIANAPOLIS WATER COMPANY."

Municipalities and Industrial Disputes

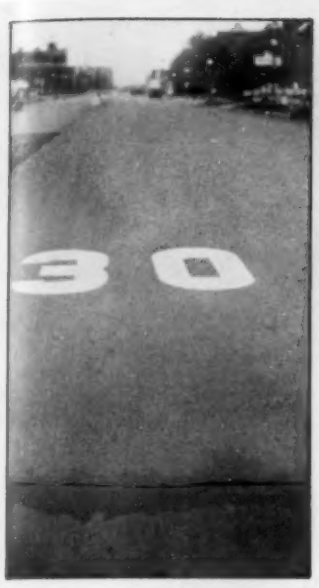
SPEAKING at the annual meeting of the United States Conference of Mayors, in Washington, D. C., November 18, Mayor S. Davis Wilson of Philadelphia outlined the successful work of the Mayor's Labor Relations Board, which began functioning almost immediately after his inauguration last January. To quote in part:

"I am satisfied from the experience gained in bringing about almost sixty conciliations during the past ten months, most of them of a major character, that the key to success in this endeavor fundamentally and never to be lost sight of lies in the American spirit of dealing squarely and fairly, with all the cards on the table, and for no one to attempt to deal from the bottom of the deck.

"Tolerance and patience should be the guiding principle of those engaged in this work; tolerance for violently conflicting and seemingly irreconcilable views; patience in permitting full expression and unlimited discussion by all those concerned. Another vital factor in the mechanics of this plan is the necessity for devoting unlimited time and energy. Conferences must not and cannot be abruptly interrupted or even adjourned after long hours, but far into the night and until day has been dawning we have sat and communed, compromised and persuaded, with tolerance and with patience, until we were rewarded finally by that yielding and concession which can only come from better understanding.

"I propose attempting to broaden the operation of the principle of our plan of conciliation in the state of Pennsylvania. Various municipalities within the state have indicated their desire to establish a board of the same character. Within the state itself there could be constituted a Municipal Coordinating Board—a central agency whose function would be to coordinate the workings of the local labor advisory bodies. Through this central coordinating agency the experience, the investigations and the findings of the separate local bodies could be marshaled for the common good of all the local subdivisions. There are endless possibilities to such a set-up, having in mind that the spirit of voluntary action so peculiarly adaptable to the municipality could be broadened into a correspondingly greater effect for peace in industry throughout the Commonwealth.

"If this can be done in Philadelphia and in Pennsylvania, conceived in the spirit of Americanism, founded in good faith, made increasingly workable by the exercise of common sense and square dealing, it can afford equal benefits to other municipalities and to other commonwealths. The rare value of such an undertaking in the light of the uncertain and precarious relationship at the moment between employer and employee throughout the length and breadth of the land is that these efforts be inaugurated before the actual walk-out occurs. The issues necessarily are more acute if the strike is permitted to actually occur. The bitterness of feeling is necessarily more difficult to temper after loss of property or money has been sustained. If the pressure is brought to bear upon both sides to go through the process of conciliation and compromise first, there can be no question of the tremendous value of such a practice. The strike is going to be settled. It must be settled, and the time to adjust the differences is before they have reached a stage which renders it ten-fold more difficult. The mechanics of the methods employed in Philadelphia and their result are open for the study and consideration of other mayors of the United States. In a spirit of helpfulness we offer these results for any useful purpose that you may see fit to make of them."



THE REGULATION OF MOTOR-VEHICLE SPEED IN ST. LOUIS TO 30 MILES AN HOUR WAS ÆMPHASIZED ON, ABOVE AND ALONG THE CITY STREETS

The "30" Campaign in St. Louis

By REYBURN HOFFMANN
Secretary-Manager, St. Louis Safety Council

FOLLOWING approval by the Mayor's Traffic Commission and assurance of the fullest cooperation by the City Courts, the Police and other city departments, the Auto Club, the St. Louis Safety Council, the Public Service Co., the Board of Education and other groups, Mayor Bernard F. Dickmann, of St. Louis, Mo., announced:

"Beginning Monday, August 24, we are going to slow down the automotive traffic of our city to a speed not to exceed 30 miles per hour, for a period of 30 days."

Mayor Dickmann requested the Police Department to observe all drivers for the next 30 days and report all violations and make suggestions for traffic improvement in their districts, and directed all uniformed firemen to cooperate by reporting all violators. The Police Court Judges were requested to try every case on its merits and to report the attempt of anyone, citizen or city employee, to fix a case, and the Clerks of the Courts were instructed to report any city employee attempting to coerce a Judge or in any way use his influence to fix a traffic case. The penalty was a suspension of 30 days without pay. The Judges of the two City Courts were instructed to keep their Courts in session from 9:00 A.M. to 12:00 noon and from 2:00 P.M. to 4:30 P.M. so that the docket could be kept clear. The newspapers were asked to print all news in connection with the campaign, and detailed reports of arrests, convictions and fines were tabulated each day.

To accentuate the "30" idea, large cloth banners carrying the numeral "30" were hung from the trolley span wires, large posters with the same numeral were fastened to the poles and light standards, and large white "30's" were painted on the pavements of the principal traffic arteries. Thousands of small windshield "30" stickers were displayed by the street cars and buses, by all city vehicles, and by commercial vehicles and pleasure cars. Three thousand truck members of the St. Louis Safety Council's Commercial Vehicle Division also bore the "30" stickers. All fire apparatus carried large "30" signs wherever design would permit, and all police scout cars carried "30" on the spare wheel covers. All schools devoted time to the theme of "30" and related safe highway practices.

All citizens, both drivers and pedestrians, were fully aware at all times that something was going on, and the immediate result was a general slackening of speed.

The Menace of Speed

Charles G. Gonter, City Traffic Engineer, in charge of the campaign for Mayor Dickmann, said:

"We are convinced that speed has reduced the safety factor in motoring. A mishap at low speed dents a fender; at 50 miles per hour it kills somebody. It is perfectly true that some drivers are sufficiently skillful and their automobiles in sufficiently good condition to drive fast with comparative safety. But even they are liable to an accident when the other

fellow, not so competent a driver, makes a mistake at high speed."

Major Albert Bond Lambert, Vice-President, Board of Police Commissioners, and in charge of all traffic safety matters for the Police Board, said the average speed of motorists arrested between June 17, 1935, and August 15, 1936, had been 42 miles per hour. A speed of 50 miles per hour was exceeded by only 5 per cent of those arrested. Using figures released by the National Safety Council, Major Lambert said:

"The difference between 30 and 35 miles per hour for a minimum speed is about 37 deaths per year and a substantial increase in injuries. If the legal limit is strictly observed and penalties adequately imposed, we can reduce our death rate, the number injured, and the number of accidents, by about 20 per cent."

At the outset Judge James F. Nagle and Provisional Judge Edward Ruddy of the two City Courts announced fines of a "dollar a mile" above the legal limit of 30 miles per hour "where circumstances warrant." During the first week fines averaged $8 against $5 for the prior week, plus $3 costs. There were some $50 fines.

More Convictions

The first week of the drive showed 98.87 per cent convictions of all speed cases tried, compared with 80.5 per cent for the first seven months of the year. During the four weeks' campaign, City Courts increased their efficiency 100 per cent. The first day, August 24, only 40 per cent of speeders were fined and 60 per cent continued. At the close of the first week this ratio was increased to 51 per cent fined, the second week to 65 per cent, 78 per cent the third, and 80 per cent the fourth. The Courts granted continuances only in extreme cases, and fined many by default and ordered many bonds forfeited. Theretofore continuances had been granted quite liberally.

The enforcement ratio of all docketed cases also improved.

The police, by the end of the first week, had jumped the daily average of speeding-arrests from 23 to 60. As an accompaniment to the curb on speeding, there was a 40 per cent decrease in arrests for minor violations, reflecting the general traffic-safety consciousness which existed.

The following table shows the steady increase in the Courts' efficiency in dealing with speeders:

	Cases	*Convictions*	*Ratio %*
First week	385	184	51.4
Second week	327	214	65.7
Third week	452	355	78.5
Fourth week	379	303	80

Continued cases resulted ultimately in 99.99 per cent convictions.

An accident summary prepared by the Director of Streets and Sewers, Frank McDevitt, covers 30 days of the campaign beginning August 24, compared with the 30 days immediately prior to that date:

Per Cent Reduction	
17.1	in accidents
22.1	in injuries
53.8	in fatalities
71.4	in skull fractures
20.2	in hospital cases
16.7	in accidents involving alcoholism
62.0	in hit-and-run cases

There were only three fatal auto accidents during the campaign, and all were pedestrians, compared with 13 fatalities before, a drop of 77 per cent.

One Death in 10 Days Against One in 2½ Days

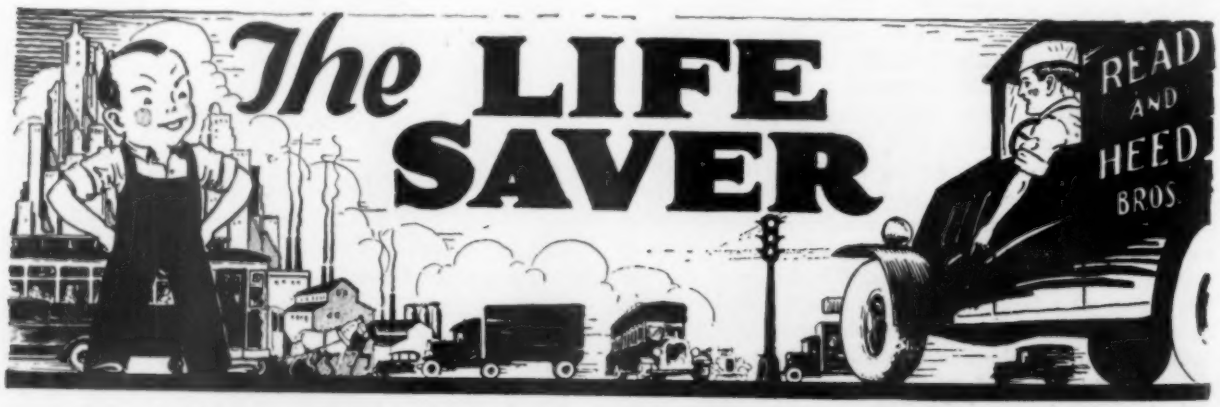
Death rate for year 1935 (164 deaths), 1 every 2.2 days.
For the 30 days before campaign, 1 every 2.5 days.
During 30-day campaign, 1 every 10 days.
The month of August motor-vehicle total was 13 deaths.
The month of September motor-vehicle total was 2 deaths.

Indicative of the general slowing-down of drivers—on the last day of the campaign only 36 speeders were apprehended. The daily average was 52 for the 30 days, and only 23 before the drive against speeders began.

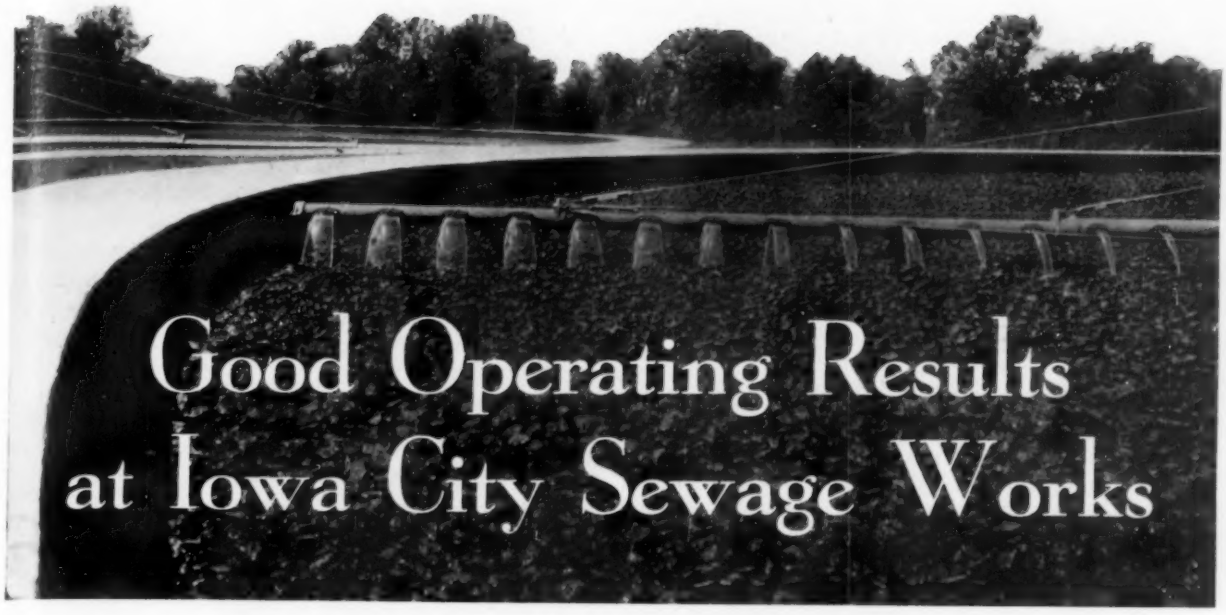
Immediately upon the termination of the 30-day period, Mayor Dickmann was urged by safety leaders to continue the drive indefinitely. Edwin A. Kayser, President of the St. Louis Safety Council, issued this statement to the press:

"By all means the "30" campaign should be a twelve-month and not a one-month drive. The saving of lives and the reduction in accidents and injuries has been decidedly worth while. The campaign has shown that it is possible to enforce traffic ordinances, and I believe the efficiency of the Courts has gained inestimable respect and support from the driving public and from the citizens generally, including the pedestrians."

Mayor Dickmann announced that the "30" campaign would continue to the end of the year.



HEADING OF A MESSAGE ISSUED BY THE ST. LOUIS SAFETY COUNCIL IN THE INTEREST OF COMMERCIAL FLEET SAFETY



Good Operating Results at Iowa City Sewage Works

Trickling Filter Installation Provides Stable Effluent—Natural Gas Heated Digester When Plant Started

By THEODORE REED KENDALL
Engineering Editor, THE AMERICAN CITY

INSTEAD of waiting for the digester to produce gas from a cold sewage sludge when the Iowa City plant was started on February 2, 1936, natural gas was used under the boiler to heat the water for the digester coils, thus speeding up the reduction of the sludge. So many plants wait somewhat impatiently for the digester to furnish the gas to heat the water or operate a gas engine, and thus waste valuable time in getting the plant really going, instead of planning a substitute for the first few weeks or months until the sludge gets settled down to a steady production of gas. At Iowa City bottled gas was used with practically no rearrangement of the heating system both for the boiler in the sewage lift station where the digester water is heated and for the main furnace in the control house.

The Sewage Lift Station

Sewage flows by gravity from the city to the plant. All but two of the sewers in the city are combined, and those two are storm sewers that lead directly to the creek. The sewage flows first through a pair of grit chambers equipped with a Jeffrey grit conveyor. The grit chambers each have a cross-section of 15.8 square feet up to the top of the dividing wall, and above that they combine to carry the larger flows. The average dry-weather flow from this city of 15,000 with an added student population of 6,000 is 1.6 mgd with maximum flows as high as 8 mgd.

The grit is delivered to two hoppers over a platform where wheelbarrows are loaded and the grit disposed of by dumping along the banks of the Iowa River. From the grit channels the sewage flows to a Jeffrey automatically cleaned bar screen with ¾-inch openings. The screen is set to operate every 20 minutes rather than when the sewage is backed up in the channel owing to clogging of the screen. The screenings are drained on the grid and are run through the Jeffrey shredder four times a day and back into the sewage flow.

Within the sewage lift station are the screen, the shredder, the boiler for heating the digester, and the pumps for lifting the sewage to the plant. The gas-fired boiler, started with the Bupane gas, is an American Gas Products unit, and is located in a separate room with the two 25-gpm American circulating pumps for the digester coil water. Each of the pumps is driven by a separate ¾-hp G-E motor. Beneath the boiler room is the wet well for the sewage. It has a capacity of 11,300 gallons and has an overflow at the top leading to the river. In one hard storm the well was nearly filled with sewage when the electricity was off for twenty minutes, but usually the battery of lift pumps provided will take care of the maximum flow through the gravity sewers from the city.

The lift pumps are located in a dry well adjacent to the wet well, and with a 22-inch concrete floor in the bottom, as the floor is 9 feet below low water in the river. The pumps include a 2-, 3-, 4- and 6-mdg American centrifugal powered by 15-, 20-, 25- and 50-hp General Electric motors respectively. An American sump pump with a ½-hp G-E motor keeps the floor of the dry well from becoming flooded. Within the dry well are also the Emco gas meter for the digester gas and the condensation trap. A 15-inch insulated conduit carries the pair of 2-inch hot water pipes to and from the digester, as well as the 4-inch gas line from the top of the digester.

Each of the pumps has an Iowa gate-valve on the suction and discharge, and an Iowa check-valve in the discharge side to prevent running the pump backward when the

current goes off. The static lift of the pumps is 27 feet. Control of the pumps is through a series of floats operating mercoid switches of the Detroit Lubricator Co. As the sewage rises in the well, the G-E float switch first cuts in the 2-mgd pump without the use of a mercoid switch on the relay. Then as the sewage continues to rise, the float operates the series of double mercoid switches, and cuts in the 3-mgd pump, and at the same time cuts out the 2-mgd unit. Similarly, as the sewage rises further, the 3 is cut out as the 4-mgd pump starts, and the 4 is stopped as the 6-mgd pump is put into operation. The pumps can all be controlled by hand as desired, in addition to the automatic operation.

The Digesters

The primary and secondary digesters are located adjacent to the sewage lift station. The primary digester is 40 feet in diameter, and the secondary is 60 feet, and both are 28 feet deep. The sludge is pumped from the clarifiers by units in the basement of the control house to the primary digester, and the overflow from it goes by gravity to the secondary. Each digester is equipped with a Dorr floating cover, and the primary has a Dorr Turbo stirring device driven by a Universal Gear Corporation motor head.

The supernatant liquor and sludge from the primary digester flows by gravity to the secondary. The gas is run from the primary to the secondary digester, and then to the scrubber and meter in the sewage lift station.

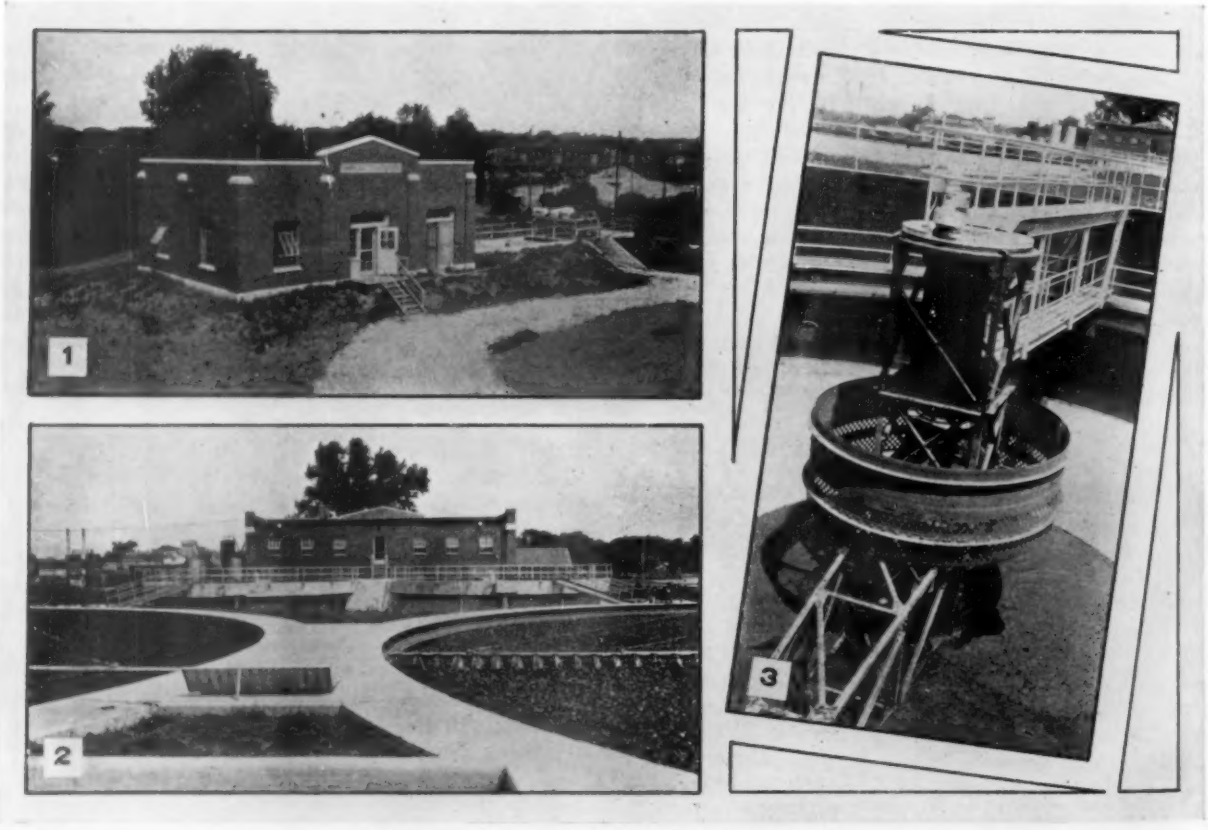
An 8-inch cast iron force line from the sludge pumps leads to the primary digester. An 8-inch Transite and cast iron line leads from the secondary digester to the twelve sludge beds. Each bed measures 40 x 50 feet and contains 16 inches of sand over the underdrains. To improve the quality of the sludge and increase gas production as well as to hasten digestion, lime has been added to the primary digester to keep the pH at 6.8.

The Control House

The control house contains the laboratory and office for the plant superintendent, as well as the control panels for all the equipment located outside that building. In the basement are two Barnes-Dorrco sludge pumps of the plunger type with 8-inch discharge and driven by 3-hp G-E motors. An American sump pump with a 3-hp G-E motor takes care of all drainage and sewage from the building.

A combination coal and gas furnace is used to heat the control house. Before the introduction of the digester gas, Bupane bottled gas was used in the building for the laboratory bunsen burners.

The 20-inch cast iron discharge line from the pumps in the lift station reduces to two 14-inch lines at the control house, with one going to each primary clarifier. On each line in the basement is a Simplex venturi meter with a Republic recorder.



THE IOWA CITY, IOWA, SEWAGE-TREATMENT PLANT

1. The sewage lift station and the grit chambers, and the automatically cleaned bar screen. 2. Rear of the control house, with two of the three 140-foot diameter rotary trickling filters. 3. The 60-foot diameter secondary clarifier, emptied for adjustments and showing the complete mechanism

Clarifiers and Sprinkling Filters

From the control house the two 14-inch lines go to the pair of Dorrco Sifeed clarifiers immediately behind the building. Each of the sludge collectors is operated by a ½-hp G-E motor. The sewage enters the clarifiers through the center cone and flows radially to the circular weir and channel under a grating.

From the clarifiers the sewage flows to the pair of central dosing chambers, equipped with automatic siphons leading to the three 2-arm 140-foot diameter Dorr rotary trickling filters. The stone in each filter is 6 feet 10 inches deep. The head on the rotating distributors varies between 24 and 9 inches. From each filter the effluent flows through a 14-inch line to a 20-inch main leading to the 60-foot diameter secondary clarifier.

The Iowa City sewage-treatment plant as described was constructed in 1935 as part of PWA Project 2,250 at a total cost of $263,375. The designing engineers were the Currie Engineering Co. of Webster City, Iowa. The plant has been operated by F. W. Louis, Superintendent, and C. Burns, R. Mott, and C. Metzger, operators, since it was started on February 2, 1936.

Operating Results

Samples are taken every two hours at the point where the sewage enters the grit chamber (raw sewage), at the dosing tank (clarifier effluent), and at the final outlet (plant effluent). These samples are composited in proportion to the flow and a daily analysis made of the composite.

Chemical results are shown below. All figures are averages to date.

Raw Sewage

Ph.—7.2
Settleable Solids—5.8 cc. per liter one hour
Ammonia Nitrogen—20 ppm.
Nitrate Nitrogen—0 ppm.

Total Solids
Total—991 ppm.
Volatile—341 ppm.

Suspended Solids
Total—304 ppm.
Volatile—186 ppm.

5-Day BOD—440 ppm.
Oxy. Consumed—104 ppm.

Clarifier Effluent

Ph.—7.2
Settleable Solids—0.2 cc. per liter
Ammonia Nitrogen—21 ppm.
Nitrate Nitrogen—0 ppm.

Total Solids
Total—794 ppm.
Volatile—231 ppm.

Suspended Solids
Total—109 ppm.
Volatile—78 ppm.

5-Day BOD—338 ppm.
Oxy. Consumed—77 ppm.

Plant Effluent

Ph.—7.5
Settleable Solids—1.7 cc. per liter
Ammonia Nitrogen—2.6 ppm.
Nitrate Nitrogen—13.5 ppm.

Total Solids
Total—745 ppm.
Volatile—143 ppm.

Suspended Solids
Total—92 ppm.
Volatile—51 ppm.
5-Day BOD—23 ppm.
Oxy. Consumed—32 ppm.

Average daily flow during the period of these tests—1.48 million gallons per day.

Average sewage temp. deg. F.
12 Midnight—72
8 A.M.—74
4 P.M.—77

Average cost for *power*—$2.85 per million gallons treated.

Social Significance of Air Pollution

THE Air Hygiene Foundation of America is an alliance of industry and science on a non-profit, cooperative basis which seeks to eliminate or control industrial diseases caused by air pollution. H. B. Meller, Managing Director of the Foundation and head of the air pollution investigation at Mellon Institute, Pittsburgh, Pa., recently gave an address before the Pittsburgh meeting of the American Chemical Society entitled, "Social Significance of Air Pollution."

He states that air contaminants come from numerous sources. Some originate in the soil of barren areas, blowing up from small bare spots or from large areas in the form of ravaging dust storms. From the millions of industrial and domestic chimneys and locomotive stacks come products of combustion of fuel—smoke, cinder, ash and gases. Exhaust gases from automobiles, and dust stirred up by moving vehicles, add appreciably to the burden in the atmosphere. Then there is the pollution of factory air, and to a lesser degree the outside atmosphere, by particles from materials used in industry and by solid particles and gases resulting from industrial processes.

Air pollution is present everywhere. It is only necessary to keep it down to a concentration that is hygienically safe and that will not cause a nuisance (as in the case of soot). In our cities the volume of material deposits from the air varies from less than 100 tons per square mile per year in very clean sections, to several thousand tons per square mile per year in sections of heavy pollution. Control of these concentrations of products of combustion is partly attained through anti-smoke ordinances. Excessive dusts and gases must be controlled from the sources and guarded against by protective equipment. Dust from bare areas must be controlled through planting.

The social significance of the smoke nuisance is measured by the discomfort and unhappiness of those people adversely affected. Cleaning and painting bills are higher, and housekeepers are discouraged by soot and dust everywhere. Vegetation is hampered in its growth, sunlight is cut off to some extent, fogs are intensified, often necessitating the burning of artificial lights in the daytime. One feels physically dirty, depressed and irritable, and is apt to grow careless in personal hygiene. All this bears a definite relation to the cultural fabric of a group and the group's personal habits and health attitudes.

Air pollution in industry is endangering the health of many workmen through the contraction of industrial diseases. It is the employer's responsibility to examine the health of the worker to make sure he is fitted for the job assigned to him. Then he should take all the precautions that are proper for safeguarding the employees from dangers that can be foreseen, providing respirators, helmets, etc., where necessary or desirable. The employee is expected, on his part, to exercise necessary precaution when working in a place where air pollution is heavy.

In a matter which is of vital interest to the health of the community, and which concerns a nuisance against which the people have a continuous resentment, the grumbling should be capitalized into a public opinion that would justify the legislative and administrative branches of the city government in passing and adequately supporting regulations that would go as far as feasible, in the light of scientific knowledge and practice.

For additional discussion of this subject, see "Civic Atmosphere and City Air," by Dr. Edward R. Weidlein, in THE AMERICAN CITY, February, 1935.

THE INDEX TO VOL. LI OF THE AMERICAN CITY,
covering subjects and places for the year 1936,
appears at the end of this issue.

Main Street of City Widened and Paved with Road-Mix

Recent Work in Yerington, Nevada, Combined Widening with New Curb, Gutter and Sidewalk

A RECENT WPMH project in Yerington included widening the main street of the city for a distance of 4,400 feet on both sides of an existing 18-foot concrete pavement. The improved street is now 40 to 50 feet between curbs, and new concrete curbs and gutters have been installed, a storm drain 18 to 12 inches in diameter laid, and sidewalks 6 feet wide on both sides of the street outside the business district completed, with a retaining curb at the back wherever the grade was raised.

The 18-inch concrete gutter was built integral with the curb, which has a 7-inch base and a 6-inch top. The gutter is 6 inches thick and the curb rises 6 inches above the gutter. The curb and gutters were built in 25-foot sections with ½-inch expansion joints between, and a dummy joint at the 12½-foot point.

Selected material from tested borrow-pits was placed under the curb, and 6 inches of the same material was placed in the roadway section. This pit-run aggregate of sand and gravel, with a minimum shrinkage of 3 per cent in a 10-inch sample baked in a mold, served as a base for 6 inches of crushed gravel from a maximum of 1 inch down to 200-mesh screen size.

Five-foot sidewalks on both sides of the street were laid with ½-inch and smaller aggregate, shot with hot slow-cure cut-back at the rate of ½-gallon per square yard as a penetration, and allowed to set and cure for a sufficient time to permit them to dry out. They were then shot with an asphalt emulsion at the rate of 1/6-gallon per square yard, and screenings were spread over the surface by hand, hand-broomed and rolled. The screenings were a maximum of ⅜-inch screen size.

The Oil-Mix Roadway

The work described above was done by contract, but the road-mix widening and shoulder paving was a day-labor project operated by the Nevada State Highway Department. The gravel that had been placed under the contract was shot with a slow-cure road oil of 65 to 72 per cent asphalt heated to 200 to 250 degrees and cut back with a fluxing oil. For a finished road mix 2½ inches thick, a total of 1.4 gallons of the road oil was applied in three applications of 0.5-, 0.5- and 0.4-gallon per square

THE COMPLETED ROAD-MIX CITY STREET WITH CONCRETE GUTTER AND CURB PENETRATION SIDEWALK IN YERINGTON, NEV.

yard. This allowed for the thickened edge at the curb and along the concrete pavement, where the oil mix is 4 inches thick.

The aggregate and oil were first mixed with a spring-tooth harrow for the top 2½ inches, and then bladed to the side in a single windrow, using a motor grader and a pull grader. Then one-half the windrow was cut with the first blade and spread about 10 feet wide and the harrow run through to further mix it. Usually on state highway operations a disc is used at the same time, but on this work equally good results were secured without the disc. The discs were dispensed with because they might spall the concrete roadway and the newly laid concrete gutter.

The second blade took the remaining half of the windrow and moved it to the far side of the 10-foot strip already spread. The first blade on returning spread this windrow for the remaining 10 feet to the concrete slab. This method permitted the harrow to be used constantly over the entire roadway and kept the three machines, two blades and the harrow, busy, thus completing the mix in a minimum of time. The material was mixed by the blades and harrow as many as eight times, and even more for short stretches.

When the mixing was complete, the material was spread to uniform thickness except at the thickened edge. This edge was cut each time as the blades were run over the roadway. The road mix was rolled at once with a 6- to 8-ton tandem roller.

After traffic had used the new road-mix section for about ten days, it was sealed with a kerosene cut-back at the rate of ⅛-gallon per square yard. The use of the side strips for traffic greatly improved the character of the roadway section and gave a far better pavement when it was sealed. The kneading action of the traffic made the top impervious, and the seal material thus formed a water-tight membrane over the entire top. Without this action of traffic the surface is liable to be porous, and the seal is likely to be absorbed and hence leave the top still slightly open and requiring another seal at an earlier date.

The Pacific Construction Co. was contractor for the curb and gutter and the placing of the 6-inch course of pit-run gravel, at a cost of $48,081.34. The road mix was applied and sidewalks completed by the maintenance forces of the State Highway Department under the direction of G. F. Armstrong, Division Maintenance Superintendent. The oil mix cost about $4,000.

Experience with Sewer Rentals

Collection Not Difficult, According to a Survey Covering 42 Cities

THE need for improved sewer service has caused many municipalities to investigate the various means of financing this service. Revenue bond financing avoids added property tax and makes this improvement possible in communities where adequate sanitary facilities are of immediate need.

A natural question which arises in the consideration of revenue bonds is the collectibility of service charges. To obtain information on this subject the Portland Cement Association made a survey and received reports on the experience with sewer-rental charges from 42 municipalities which were operating sewage works on a rental basis even though financing in some cases was done by revenue bonds. Five of these cities are not on a strictly rental basis, for the charge is added to the real estate tax bill and collected annually, being more in the nature of a special assessment.

Collections

Of the other 37 municipalities, only one reported difficulty with collections. The percentage of delinquencies reported is very small, varying from 0 to 10 per cent, although one city reported 20 per cent, and two reported as high as 30 per cent during the worst period of the depression. Experience with delinquencies seems to be about the same as with water bills.

Billing

The common practice in billing is to show the sewer service charge and the water charge on the same bill, but as separate items. Twenty-one cities definitely report this method, and only two render separate bills. The majority favor monthly billing. Only a few grant discount for prompt payment, but practically all municipalities have one or more effective penalties for non-payment. Some cities add a charge of 5 or 10 per cent to the total amount of the sewer-rental bill if not paid by a stipulated time; others have provision for disconnecting the water supply; a few provide for disconnecting the sewer, but it has seldom been found necessary to resort to this last penalty. In nearly all cases, delinquent accounts become a lien on the property and are certified on the tax rolls for collection. Where these provisions are in effect, there is practically no loss on sewerage accounts, as they then come in the same category as inescapable property taxes.

Many cities have devised collection procedure particularly suited to local conditions. In the case of Monmouth, Ill., an ordinance was passed early in 1935 establishing a new schedule of water rates and another ordinance was made effective at the same time providing for a use and service charge for sewerage works based upon the meter records of water consumption. A third ordinance was then passed which grants a discount of 33 1/3 per cent of the gross bill, the discount to be allowed only if the combined charges of both water and sewer service are paid on or before the 10th day of the following month. If a customer takes advantage of the discount, his net bill is less than the charge for water alone, and consequently the bills are paid promptly.

Below is given an example of a monthly bill.

WATER

Metered Consumption Water	Rate 1st 10,000 Gals.	Charge
5,000	57c per 1,000	$2.85 water
5,000	27c per 1,000	1.35 sewer
	Gross bill	$4.20 comb.
Discount if paid before 10th of month, 33⅓%		1.40
	Net bill	$2.80

The Mayor and City Attorney, who were jointly responsible for this plan in Monmouth, are well pleased with its success and the cooperation of the residents. The ordinance passed in Monmouth providing for billing and discount is reproduced below because it illustrates the progressive attitude of a community in fitting local government to its own needs. A complete article on the Monmouth, Ill., sewage-treatment plant, which has many interesting features of itself, will appear in the February, 1937, issue of THE AMERICAN CITY.

Several years of experience with the sewer-rental plan in many widely separated municipalities show clearly that with adequate ordinances, fair rates, and sound methods of billing there is no trouble with collections. Any fear of uncollectible delinquencies is not justified by the practical experience reviewed so far. In Brockton, Mass., delinquent accounts are finally collected by adding the charge to the tax rolls. To reduce the number of delinquencies, a summons is issued if the bill is not paid in 30 days from the date of issue. No losses are sustained on account of sewer rental. The summons reads:

Your bill for Sewer Rental, amounting to ————, is now due. You are required to pay the same within ten days from this date, with twenty cents for this summons. At the expiration of that time, if the bill is not paid, the collector will proceed to collect the same according to law.

FRANK J. WARD,
Collector of Taxes for the City of Brockton.

AN ORDINANCE PROVIDING FOR THE METHOD OF RENDERING WATER AND SEWER BILLS BASED ON METERED SERVICE AND PROVIDING FOR DISCOUNTS TO BE ALLOWED UPON SAME.

Be it ordained by the City Council of the city of Monmouth, Illinois:

SECTION 1. That the City Council shall render statements to the consumers of water on metered service and the users of the sewerage system on the first day of each calendar month.

Effective June 1, 1935, said statements to consumers of water on metered service, who are also users of the sewerage system, shall be prepared in such a manner that the monthly bill for water and the monthly bill for sewer rental shall be included in the same statement.

SECTION 2. Effective June 1, 1935, consumers of water on metered service, who are also users of the sewerage system, shall be allowed a discount on both water and sewerage bills of 33 1/3 per cent, provided only that both water and sewer bills are paid on or before the 10th day of the month in which said bills are rendered.

SECTION 3. Effective June 1, 1935, consumers of water on metered service, who are not users of the sewerage system, shall be allowed a discount on water bills of 33 1/3 per cent, provided that said water bills are paid on or before the 10th day of the month in which said bills are rendered.

SECTION 4. This ordinance shall be in full force and effect as of May 1, 1935.

EARL MCKINNON,
Mayor.

Attest:
MILTON H. CARRIER,
City Clerk.

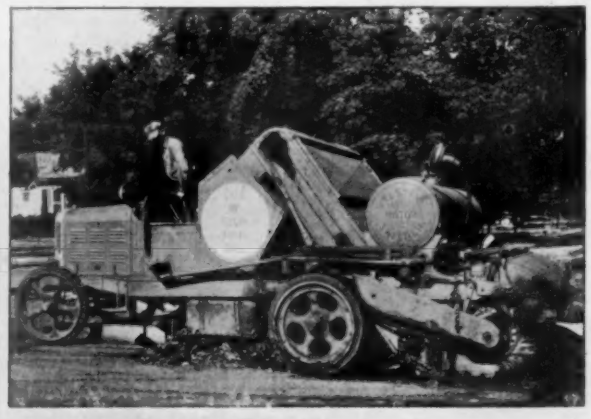
Progress in Street Cleaning

Machine Sweeping Costs Compared to Hand Costs in Pekin, Ill.

PEKIN, ILL., has recently had an opportunity to recompare the results and the cost of hand sweeping of streets with motorized sweeping. For approximately three weeks the city's Austin-Western pick-up sweeper was kept off the job to give work to ten men on the relief rolls. At the end of three weeks it was necessary to start the sweeper, which swept up five truck loads of dirt per operating hour, according to William McLeod, who operates the sweeper under the direction of Fred Gebhardt, Superintendent of Streets.

There are 50 miles of paving covered by the sweeper in Pekin, including 20 miles of concrete paving and 30 miles of brick paving. Three men are employed, and the street sweepings are picked up and carried to the garbage dump.

The sweeper uses less than one gallon of fuel per hour and a quart of crankcase oil every 500 miles. In ordinary operation, the sweeper is run from two to three hours daily and covers the entire city in approximately three weeks. Pekin has a population of more than 13,000 and is the county-seat of Tazewell County.



CLEARING SWEEPINGS FROM THE GUTTER AND DUMPING THE LOAD

The Modern Refuse Incinerator—A Sanitary Municipal Utility

By G. C. HOLBROOK
Mechanical Engineer, Department of Sanitation, New York City

INCINERATION of rubbish, garbage and other combustible municipal wastes is now recognized as the most sanitary and the most desirable method of disposal. The practice of dumping refuse at sea, hog feeding, burial and dumping on land is generally falling into disuse, as evidenced by the erection of more than 700 incinerator plants throughout the country.

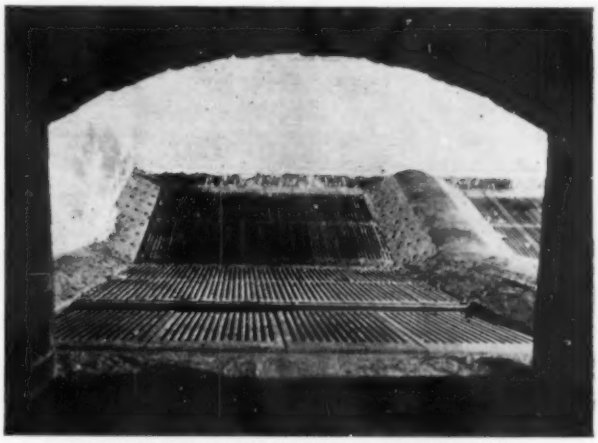
Since the first plant was erected in Nottingham, England, in 1874, great improvements have been made in furnace designs and materials, equipment for handling refuse within the plant, and the gradual increase in the utilization of waste products either as power, salvaged articles, or the residue in many forms.

The buildings of our early incinerator plants were designed for their utility rather than their esthetic value. Since they were generally erected outside populated districts, it was not necessary to spend money on their embellishment, but essential to maintain a low cost of construction. With the increase in urban population and the attendant difficulties in obtaining incinerator sites, it became apparent that if these buildings were to become part of a civic development, some consideration had to be given to their architectural and sanitary layout. During the past decade there has been a marked improvement in this direction. The employment of machinery to facilitate the movement of refuse through the plant, with means for processing, has lessened the danger of objectionable odors and the demoralizing effect on hand labor. Many incinerator plants of recent construction are on a par with large business and commercial structures. Very often their identity is not recognized until one observes the entrance and exit of collection trucks or takes the time to pay the plant a visit.

Cleanliness and Safety

A modern incinerator plant is equipped with the best sanitary accommodations for its workers. In order to protect the health of the men and uphold standards of cleanliness, ample showers, individual lockers, etc., are provided. Light and ventilation are also factors in maintaining a sanitary environment. The employment of mechanical ventilation to lessen the concentration of dust and noxious odors which may arise from garbage in a state of putrefaction or in the delivery of refuse are taken into consideration. Forced-draft fans are often connected to areas to be ventilated, discharging the dust- and odor-laden air to the furnaces.

Safety features are adopted and precautionary measures taken to insure the safety of the men under all circumstances. Goggles have saved the eyes of firemen from exploding materials within the furnaces, and dump-floor laborers have been restrained from falling into furnaces when wearing safety belts. The matter of safety is of course a state requirement, and all ordinances with respect to safety should be followed. It is evident that men will work with greater efficiency if some thought is given to their safety. Furthermore, it is good economy to keep skilled men on the job when efforts are being made to reduce the cost of incineration. The operation of an incinerator is quite as important as its design. Without trained and experienced operators, a well-designed plant can become a nuisance, with the inevitable complaints from an outraged citizenry. The maintenance costs can rise beyond reason if furnace temperatures are uncontrolled or improper cleaning methods pursued, if there is misuse of equipment placed in the plant for the convenience of the operators, or other infractions of orderly procedure.

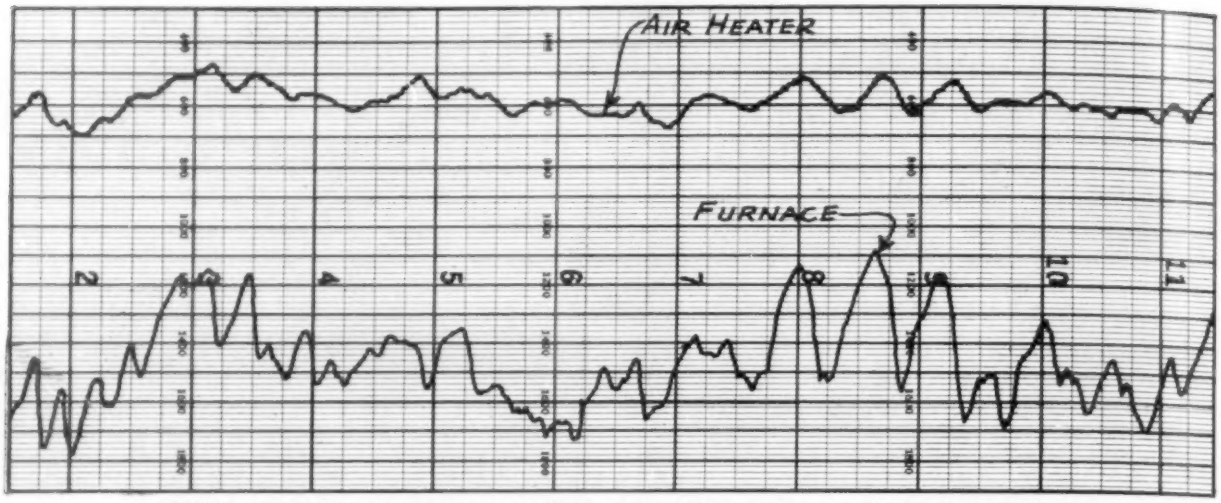


THE GRATES AND SURROUNDING CASTINGS OF A REFRACTORY STRAIGHTLINE FURNACE

Furnace Design

Since an incinerator is a point of final disposal of municipal refuse, it is expected to receive and destroy anything delivered to it regardless of the nature of the material. For this reason the design of furnaces and the methods of operation are held to simple lines. The batch-feed, gravity-charged refractory furnace seems to meet the rigid requirements as already stated. The three principal forms of this type of furnace are the beehive or circular furnace, the rectangular straight-line furnace, and the rectangular mutual assistance furnace. All three have their proponents and are capable of destroying their rated capacities when correctly designed.

Furnaces fall into two main groups—the refractory, and the steel-clad water-jacketed. The refractory type has been developed to a greater extent because of its greater adaptability to varied municipal requirements. The ultimate design is influenced by the specified refuse, shape



A TYPICAL AIR HEATER AND FURNACE TEMPERATURE CHART FROM A RECORDING PYROMETER

and size of property, capacity of plant, number of furnaces required, and the many improvements advanced by the manufacturers. These conditions are constantly changing with population trends and racial make-up, so that it is practically impossible to standardize units along commercial lines.

Furnaces are designed to consume varied mixtures of garbage, rubbish and other matter as collected and delivered to the plant, without odor, smoke or dust in the products of combustion. With skillful operation and a design that will effect dust precipitation and an approach to complete combustion, it is possible to avoid any nuisance. The refractory furnace, with substantial "built-up" walls of first-grade firebrick, backed up with insulation for the retention of furnace temperatures, is best suited to burn high rates of garbage.

Some of the principal improvements in furnace design and materials are: the elevation of units to permit direct removal of residue by truck from large-capacity ash hoppers; increased size of ash dumping or clinkering grates, hung walls and arches to lessen the labor of maintenance; electrically and pneumatically operated charging gates for feeding furnaces; the wider use of temperature and draft recording and indicating instruments to assist the firemen and other operators in the maintenance of proper furnace temperatures; and improvements in refractories and insulations, and furnace castings through the introduction of variable percentages of chrome to limit growth within the metal.

Refractories are economically placed throughout the furnace and flue system. A first-quality non-spalling firebrick is generally placed in the furnace and combustion chambers where temperatures run high and fluctuate over a wide range, owing to charging and clinkering operations. This is severe service, and calls for a brick that is resistant to thermal shock and slag penetration. In the flue connections to pre-heaters, by-passes, boilers and stack, or what might be referred to as the low-temperature zone, a lower quality firebrick can be used. Insulating refractories can be used to advantage in these areas, and often lead to further savings in structural support because of their relatively light weight. They are coated with a wash of refractory cement to resist slag penetration and the erosive action of the gases. Their use in guillotine dampers is particularly serviceable because of the insulating effect, which is approximately three times that of firebrick or other refractory material employed in this type of damper.

The flat suspended arch and hung wall has found a place in incinerator furnace construction. Although this type of wall and arch has been used for a number of years in power-plant practice, it is relatively new in destructor design. It offers opportunities to introduce features in furnace design for improved combustion and dust precipitation which are not possible in the sprung arch and solid wall construction. Maintenance costs are of course lessened because of the simple method of replacing burned-out tile as compared to the more laborious work of replacing a solid wall or sprung arch. Air cooling of walls, if found desirable, is readily accomplished by means of an air lane over the outer surface of the brick and supporting castings. In burning rubbish at high rates, where temperatures are likely to run high, air cooling of walls and arches might prove to be profitable in refractory maintenance, and if connected to the forced-draft system, considerable savings in radiation losses would be made. It is quite possible to supplement air preheaters with forced-draft air thus obtained.

Air preheaters are indispensable when burning refuse containing large percentages of moisture. The total moisture content of an average mixture of rubbish and garbage may vary from 20 to 30 per cent and possibly higher if collections are made on days of heavy precipitation. Heaters are used with discretion by skilled operators and are usually cut out of service when temperatures start to climb. Preheaters are built with vertical or horizontal metal or refractory tubes supported in metal or refractory headers. They are also built, to a lesser extent, with refractory tile erected in honeycomb fashion and with air and gas passes arranged cross-flow. With the tubular heaters, the air and gas is generally carried in a counter-flow direction or in a combination of cross- and counter-flow as the design dictates. The most desirable arrangement provides a downward flow of gas through the tubes. Dust and entrained solids in the gas stream are less likely to build up a deposit on the tube calling for frequent cleaning. Furthermore, the area directly below the heater is used as an effective dust pocket. The heat transfer

through a metal heater will range from 3 to 5 Btu per square foot per hour per degree difference between average gas and air temperatures.

It has been customary for a skilled fireman to judge furnace temperatures by the color of the flame. This can be accomplished fairly accurately if an optical pyrometer is at hand, but if left to human judgment, refractories may suffer or temperatures may not be maintained high enough to effect complete combustion. A modern incinerator is equipped with recording and indicating pyrometers. The latter are, as a rule, placed in the furnace room for the convenience of the firemen and are grouped on the same panel with the draft gage. When these instruments are properly located throughout the plant, they form a source of information which can be used for improvements in furnace design and materials. The selection of the proper type of thermo-couple is of the utmost importance and should be protected, if possible, with a tube of silicon carbide or carbofrax which has been found to resist slag adhesion. Because of its lower cost and sufficient accuracy, the milli-voltmeter pyrometer has taken precedence over the more accurate potentiometer.

Use of Waste Heat

The increasing use of waste heat has widened the scope of incineration in the field of power. There is not room here to discuss the economies involved, nor its application to the several American installations. Europe has made great strides in this direction and has succeeded in erecting a number of salvage and power plants. It is not intended in this brief article to present with any degree of completeness the broad subject of incineration, but rather to point out the advances made by the engineer in this important section of the field of sanitation.

Aeration and Filtration for Altamont, Illinois, Water

AFTER successive improvements to the water-works plant of the city to keep pace with the growth of the community, Altamont was authorized by the Public Works Administration, on November 26, 1934, to advertise for bids for the construction of a new water system. The PWA allotted a loan and a 30 per cent grant totaling $42,000 for the work. In December of the same year the State Department of Public Health approved the plans and specifications for the plant, and on January 8, 1935, C. J. Moritz, Inc., of Effingham, Ill., began the construction on the plans of the W. A. Fuller Co., engineers, of St. Louis, Mo., who designed the entire project.

The project included the construction of a new dam and impounding reservoir, aerators, chemical treatment, filters and two pumping plants. The 400-foot-long dam of earth, with a reinforced concrete face on the upstream side, has a 30-foot reinforced concrete spillway 4 feet below the top of the dam. The lake created for this new water supply occupies 20 acres, and the reservoir has a capacity of 60,000,000 gallons. Second Creek, the source of water, has a drainage area of 2,000 acres. The reservoir pump house is a brick structure with two automatically controlled electric-driven pumps with a combined capacity of 300 gallons per minute. Control is over a power line from the city, energized by the municipal electric plant, which is also being modernized as a continuation of this project. Two and one-half miles of 6-inch cast iron main connects the reservoir pumps with the filtration plant in Altamont.

Two pan aerators outside the filter building provide for the removal of the distinct hydrogen sulphide odors caused by the rotting vegetation in the new reservoir

INTERIOR AND AERATOR OF THE NEW WATER FILTRATION PLANT, ALTAMONT, ILLINOIS

THE OLD 40,000-GALLON ELEVATED WATER TANK STANDING GUARD OVER THE NEW FILTRATION PLANT AT ALTAMONT, ILL.

and for the oxidation of the iron in the water. It is very effective in both instances. The water flows from the two aerators toward the filter building through a flume and then into a mixing flume at the entrance, to which granulated alum is added at the rate of 15 pounds per day for a flow of 60,000 gallons. The water flows through a series of under and over baffles for about 25 minutes, and at about the midpoint it is dosed with 10 pounds per day of lime to which activated carbon has been added to complete the removal of odors and tastes.

A period of six hours retention in the sedimentation basins removes the floc, and then the water flows directly to the two 6 x 8-foot filters. There is 4 feet of water over the top of the sand, and the wash-water trough is 2 feet above the sand. Cast iron underdrains with 4-inch manifolds and 1½-inch laterals with 3/16-inch holes for both intake and washing underlie the bed of filtering material. There are 8 inches of coarse gravel, 6 inches of medium gravel, and 6 inches of fine gravel, with 36 inches of filter sand on top. A complete set of four valves—influent, effluent, wash and drain—are provided for each filter.

International rate-of-flow and loss-of-head gages are provided. A Wallace & Tiernan chlorinator applies a dose of 2 ppm of chlorine to the water between the filters and the 60,000-gallon clear well, which was a part of the old system with the 40,000-gallon 40-year-old elevated steel tank.

The filter plant was designed for a total capacity of 200,000 gallons daily when operated continuously on the basis of a flow of 2 gallons per square foot of filter area per minute. The mixing chamber, settling basins and filters are constructed of reinforced concrete, which was waterproofed to give long life to the structure. The settling basins were designed with hopper bottoms connected to underdrains so the sludge can be drained without entirely emptying the basins and wasting a large amount of water.

There are two 150-gpm Dayton-Dowd raw-water pumps at the reservoir operating against a total head of 80 feet, and driven by 5-hp electric motors. Either will supply the water necessary for the operation of the plant, the second being a standby. One new high-service pump, a 350-gpm Fairbanks-Morse horizontal centrifugal driven by a 30-hp F-M electric motor, was purchased and installed. This pump is also used for backwashing the filters, and is designed to deliver between 500 and 550 gpm at a 40-foot head. This is the proper amount for washing filters with a rise of 24 inches per minute. The city already owned a 300-gpm Dayton-Dowd horizontal centrifugal with a 30-hp Allis-Chalmers slip ring motor, which was moved from the old water-works plant to the new.

Harry Fuller, of W. A. Fuller Engineering Co., was in charge of the inspection and construction of this plant, which has been operated since completion by Dale Leitzel, Superintendent of Water Works, and Elmer Sidener, Engineer.

The total output of the plant is recorded by a Republic-International master meter, and all the services in the city are metered. As a result of the improved quality of the water and the increased use by the citizens, it was possible to cut the water rates in January, 1936, only a few months after the new plant was placed in operation.

When Were Public Utilities Soundest and Stablest?

When do you think the public utilities of the United States were really in the soundest and stablest position? Was it back in the "good old days" when there was no regulation except that of the state commissions, when there was no national control or effective publicity for security issues, and the Insulls, Foshays and other promoters were free to take your money in exchange for engraved paper; when the people of the United States were paying more than twice as much per kilowatt-hour for residential service as the people of Canada; and when the absolute control of this great industry was being rapidly concentrated in the hands of a few super-holding companies and so-called investment trusts? Or is the industry really in sounder shape today, when its security issues are subject to registration and control; when cooperative Federal and state regulation has been established for holding companies and interstate operating companies; when future mergers and consolidations must run the gauntlet of official approval; and when rates have been or are being reduced to levels that promote constantly increasing use of electric energy by all classes of consumers?

—From an address by Basil Manly, Vice-Chairman of the Federal Power Commission, delivered before the United States Conference of Mayors, Washington, D. C., November 17, 1936.

Mud-Ball Troubles Solved by Surface Wash for Filters

Method Devised at Kenosha, Wis., Adopted by Other Lake Shore Cities

MUD balls have been a nightmare to many filter operators, but Edward W. Fanning, Superintendent of Filtration at Kenosha, Wis., was the first to devise an effective method of surface-washing the filter sand to scrub the sand grains clean and prevent the formation of mud balls. The installation is simple, consisting of 1-inch pipes laid at regular intervals across the filter beds about 2½ inches above the sand, and with ⅛-inch holes spaced 9 inches apart, staggered so that the jets alternate. The wash water is first applied vertically to lift the bed to the level of the jets, and then the surface wash is applied at about 65 pounds pressure for two to three minutes. This effectively removes 50 to 60 per cent of the mud. The full vertical wash is then given the sand bed for four to five minutes, continuing the surface wash.

This method has been in use in Kenosha for three years with no cracks or other evidence of mud balls as yet in the filter sand. Formerly the filters were in such bad condition that it was necessary to rebuild them completely every four years. Racine, Wis., which also uses Lake Michigan water, has built this system of surface wash into its filters, and other cities similarly situated are considering it.

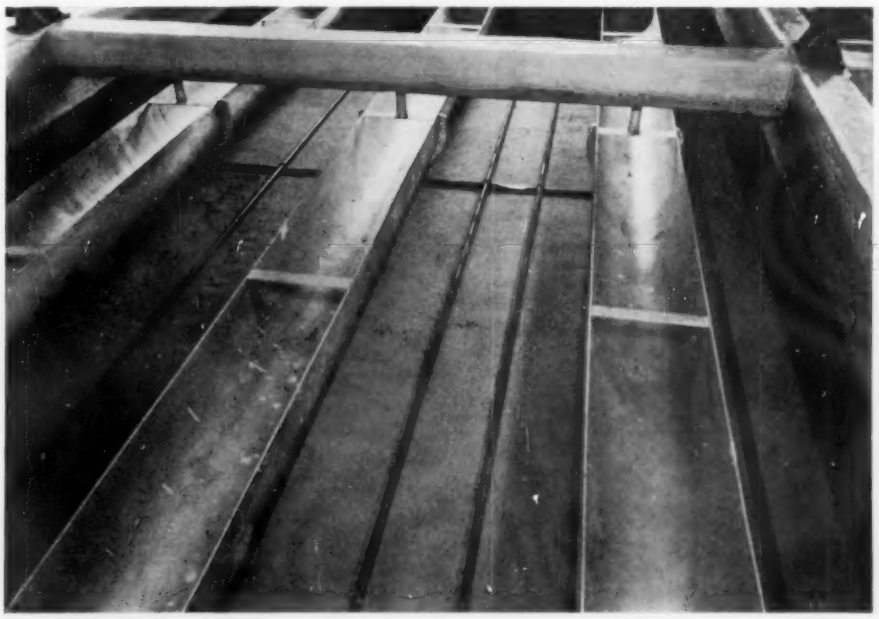
Kenosha is a city of about 53,000 population, with a water consumption of 10.5 mgd during the hot weather, and an average year-round consumption of 4.4 mgd, or 83 gallons per capita daily. It has an inexhaustible source of water, Lake Michigan, at its front door. An intake for the water works is located 4,700 feet out in the lake, northeast of the harbor entrance. The intake is in 35 feet of water and has five upturned elbows. The water flows by gravity through a 42-inch cast iron line to the raw-water tunnel, which extends from the bulkhead line to the wet well in the pumping station.

The low-lift pumps consist of two steam pumps and a motor-driven unit: a 12-mgd Manistee centrifugal with a 16-inch discharge line driven by a Sturdevant steam engine; an 8-mgd Allis-Chalmers pump with a 16-inch discharge driven by an American Blower steam engine; and a 15-mgd Manistee centrifugal with an 18-inch discharge driven by a 100-hp Westinghouse motor.

Treatment of the Water

The pumps discharge through a 36-inch cast iron line to the mixing chambers. On the way, anhydrous ammonia is applied at the rate of 1 pound per million gallons; and 15 feet further on, chlorine is applied at the rate of 3 pounds per million gallons. The chlorine dose is heaviest in summer, 3 pounds, owing to the bathing load and the presence of a larger number of algae in the lake water. The flow of the ammonia and chlorine are controlled by Wallace & Tiernan ammoniators and vacuum type chlorinators respectively.

To remove the turbidity from the water, alum is applied at a maximum rate of 1 grain per gallon, by one of the two Infilco dry feed machines. The use of these two



THE LAYOUT OF SURFACE WASH PIPES ON FILTER NO. 4 AT KENOSHA, WIS.

Note the absence of surface dirt

machines is alternated. Northwest winds in winter cause high turbidity, the exception being in 1935-36 when the lake was frozen over during the period of high winds and protected the water from the stirring action which causes the turbidity. The rate of application of the alum never goes below 0.5-grain per gallon. The alum reaches the water about 25 feet ahead of its reaching the first mixing chamber.

Two mixing chambers, each 27 x 27 feet and 13 feet deep, permit adequate mixing of the chemicals. In the first chamber an International mixer rotates at 3 rpm with two metal fins on the rotating arms. In the second chamber, which the water enters through a sluice-gate, the mixing device rotates at 1 rpm. The floc formation can be readily seen in the second chamber, from which the water flows through a sluice-gate into a concrete flume to the settling basin. Provision is made in the flume for the application of activated carbon with a Wallace & Tiernan dry feed machine. This method of removal of tastes and odors has been discarded because of the effectiveness of even moderate aeration of the water flowing from the settling basin to the filters.

The settling basin has a capacity of 1½ mg with an average detention period of six hours. A grid of small pipe in the flume from the settling basin, and the application of about 41-cfm of air from a small compressor, have led to the design of a larger installation. The small amount of aeration has reduced the odors in the settled water from 20 to 4.

The Filters

The original plant, with eight filters, was built in 1917, and four filters of larger capacity were added in 1929. The old filters have a capacity of 1 mgd each, and have brass strainers in the tops of the laterals for the underdrains, while the new filters have perforations in the bottom of the cast iron laterals. The old filters have 20 inches of five graded sizes of gravel and 24 inches of sand. The new filters, which have a capacity of 1½ mgd, have the same amount of gravel but have 30 inches of sand.

The wash-water troughs of the old filters are semicircular and have the tops 2 feet above the sand. Washing lifts the bed 6 inches at a rate of washing of 14 gallons per square foot per minute. The new filters have a rate of wash of 18 gallons. On the old filters the wash-water troughs run from front to back, and there are three for each filter. The surface wash pipes for these filters are installed with one pair between each pair of wash-water troughs, and a single 1-inch pipe under each trough. The details of the pipes are given in the first paragraph of this article.

The old filters are equipped with Simplex loss-of-head and rate-of-flow controllers and recording gages, Rennselaer valves and New York Continental control tables. The hydraulic valve that formerly controlled the air wash, which was discarded when the surface wash was installed, now operates the valve on the surface wash. The filter-runs in winter according to the loss-of-head gages can be as long as 40 to 50 hours, but they are usually cut out at 30 hours. In the summer the runs are as short as 4 to 5 hours because of the heavy plankton load. The surface wash has increased the length of the summer runs in the three years since it was installed.

On the new filters the wash-water troughs run across the beds and are V-shaped. This permitted the installation of the surface wash pipes uniformly 16 inches apart, running from front to back of the filters. These filters are equipped with Roberts filter tables.

High-Lift Pumping

From the filters the water flows to a 2½-mg clear well and thence to the high-lift pumps. The water from the clear well is dosed with about ½-pound per million gallons of chlorine through a Wallace & Tiernan chlorinator, so as to leave a residual of 0.11 to 0.12 ppm in the distribution system.

The high-lift pumping is done by four pumps: a Prescott cross-compound steam pumping engine of 6-mgd capacity; two Allis Chalmers cross-compound steam pumping engines of 6-mgd capacity each; and a standby unit, a 15-mgd Manistee centrifugal driven by a 700-hp Westinghouse motor.

Water is pumped into the gridiron distribution system, and through it and a 24-inch line to a 2¾-mg Graver tank on high ground west of the city. The tank floats on the line and furnishes a pressure of 45 pounds in the outlying district, and the pressure in the low sections of the city is 80 pounds.

A 5-mgd Aurora centrifugal pump at the storage tank west of the city can be used to boost the pressure through the system by cutting off the tank from the system and using it as a source of supply for the booster pump which pumps direct into the system.

The steam plant at the main pumping station consists of three Wickes vertical tube boilers of 150 bhp each. They are hand-fired with high-grade bituminous coal having 14,350 btu per pound and sulphur 0.94 per cent. The ash runs 5.88 per cent. The coal is delivered to the plant by boat from the eastern mines.

The Water Works of Kenosha, Wis., are operated under the direction of J. W. Myers, Jr., Assistant City Engineer, with Edward W. Fanning as Superintendent of Filtration.

Harry E. Jordan Appointed Secretary

THE General Policy Committee of the American Water Works Association has announced the appointment of Harry E. Jordan of the Indianapolis Water Co., Indianapolis, Ind., as Secretary of the Association. For over seventeen years Mr. Jordan has been actively associated with the Association as Director from 1932 to 1934, and in 1936, was President of the Association in 1934-35 and the recipient of the John M. Diven Memorial Award for outstanding service to the Association in 1936. Mr. Jordan took office as of December 1, 1936, at the headquarters in New York City.

Other engineering activities outside of the American Water Works Association include: Chairman, Indiana Section, American Chemical Society; General Chairman of 1931 Convention, American Chemical Society; Chairman, Editorial Board, Manual of Standard Laboratory Practice of Water and Sewage, 1933 to 1936. He was a member of the Advisory Committee to the Secretary of the Treasury on U. S. Standards for Drinking Water used in interstate trains.

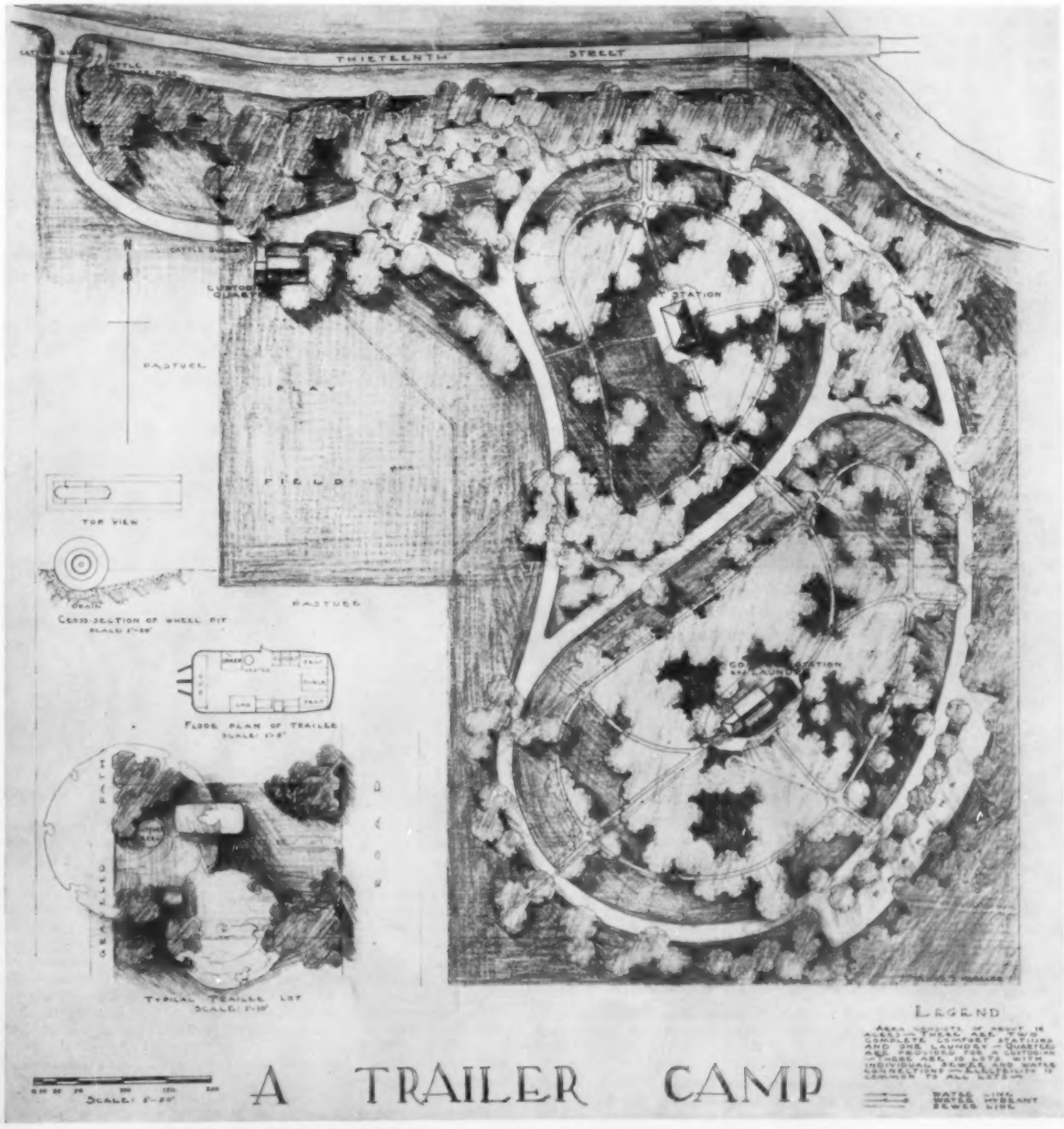
HARRY E. JORDAN

The Trailer—Liberator or Menace?

By P. H. ELWOOD
Head of the Department of Landscape Architecture, Iowa State College

THE trailer is either the coming liberator of a vast number of the American people or the most devastating, unsocial and uglifying element since the scourge of billboards, hot dog stands and the gasoline stations swept like a devastating prairie fire across the fair American landscape. If it is to be a useful tool or piece of equipment, this thriving infant industry must be carefully scrutinized and adequate facilities planned for the accommodation of its products and their users.

Without attempting statistics or predicting the future of this newest phase of *culture Americana*, we should recognize the fact that the American Automobile Association estimated that this year one million Americans are spending a part of the year 1936 in trailers. Many of the



Plan drawn by Claire J. Mueller, a senior student of landscape architecture at Iowa State College

"gypsies of the highways" are like migratory birds following a trail of warm sunshine south in autumn, and the cooling northern breezes in the springtime. However, it is the semi-permanent trailerite who gives us the most concern. He presents serious problems of economics, hygiene, and social welfare. How is he to be taxed? How are his children to be schooled? How is he to be policed and controlled by laws, both state and interstate? How are the motorists traveling on our highways to be protected from the annoyance and unsightliness and dangers of promiscuous parking and uncontrolled use of highways by trailers? And, finally, how can such a potential menace be turned by planning and control into an asset, a veritable liberator for heretofore penned-up millions of Americans craving new scenes and action?

As a step toward a partial solution of some of the problems, senior students in the Department of Landscape Architecture at Iowa State College have planned one of the first trailer villages in America. This is not a made-over residential subdivision, but an effort to provide the trailerites with the amenities of modern American home life, such as water, sewers, electric lights, roads, shade trees and shrubbery.

Definite marked lots and concrete wheel-insets, it will be noted on the plan, are among the proposed features in the village designed for this new and fast-growing group of American nomads. The immediate need for such a planned trailer village at Iowa State College is to meet an actual demand on the part of many self-supporting students for more economical housing facilities. Besides, a recently constructed golf course and recreational area has taken over the wooded summer camp grounds where summer school students formerly occupied free tent space or did extremely light housekeeping in antiquated house trailers.

But before such a group again is admitted, there will be a well-organized plan providing sanitary and other conveniences. It is even proposed to have sewer and water connections for individual trailers. A custodian near the entrance will assign each resident to a lot and a parking place for one car *not* to be on the lot itself.

Trailers will be rolled by hand into their proper grooves and remain until the resident leaves the village. Permanent planting of trees and shrubs, as well as walks, drives, and paved areas, will be arranged so far as possible to give the appearance of a permanent village.

Through the national organization of trailer users and owners and their fine magazine, *Trailer Travel*, coupled with the aggressive engineering and technical skill available, there is little doubt that better planned and designed trailers will be forthcoming. Less stress, except for sales value, on useless and meaningless streamlining and more on insulation and homelike character of the trailer at rest in its more or less permanent situation, all will bring new and greater achievements for this intriguing mode of living. If given proper thought and intelligent planning, trailer villages offer great opportunity for part-time and seasonal industries, recreation, large convention centers, and convenient, sanitary, economical and attractive homes.

There should be no unjust reflections on this highly respectable, energetic, floating population, but we must provide proper harbor and docking facilities or much floating, lawless wreckage will clog our highways, endanger our lives and vitiate our suburbs, and smear our scenic areas with a spectacle of waste, neglect and desolation. This must not be permitted. What is needed is:

1. Recognition of the problem and an honest attempt to solve, not dodge it.
2. Properly planned, supervised and maintained trailer roadside camps and suburban villages, with water and sanitary conveniences.
3. Adequate laws for police protection, education of children and just taxation.
4. Proper state and interstate rules and laws governing migrants.
5. Rational regulation of trailer traffic on streets and highways.
6. Industrial planning to provide continuous employment for trailerites.
7. More homelike and less streamlining trailer design.
8. Permanent, attractive settings in permanent villages and roadside groups.

EDITORIAL NOTE.—See also 'Trailers and Cities," by William H. Ludlow, THE AMERICAN CITY, October, 1936, page 61.

Auto Trailer a House, Court Rules

"A HOUSE trailer of the type occupied by the defendant, and having a great many of the appointments of a modern home, would come under the scope of a human dwelling, whether it stands upon blocks or the wheels attached thereto or whether it be coupled to or detached from an automobile."

This decision handed down on November 12, 1936, by Justice of the Peace Arthur R. Green, of Orchard Lake, Mich., may help to establish an important legal precedent in relation to automobile trailers. The conditions leading up to this ruling are narrated in *News-Week* for November 21:

"On summer week ends and vacations diversion-seeking Detroiters swarm to southern Michigan's myriads of little lakes. Many of them have evolved a cost-saving holiday system: instead of renting hotel rooms or cottages, they buy a trailer and park it by a lake.

"This year Hildred Gumarsol, who works in a Pontiac, Mich., automobile plant, rented part of a vacant lot at Orchard Lake, northeast of the city, for $20. He towed his trailer onto the lot, set it up on sawhorses, and built a screened-in porch on the front end. Later five other trailerites set up light housekeeping around the Gumarsol establishment.

"In August, Orchard Lake property owners rebelled. Clarence Carson, Police Chief, explained their position: 'These people roll in in their trailers and proceed to enjoy all the privileges of the lake without paying taxes . . . and they aren't discreet in getting into bathing suits, either.'

"Carson thumbed through the city ordinances looking for one to fit the case. Finally he came to No. 30: all dwellings must have a floor space of at least 400 square feet. Thereupon he arrested Gumarsol and his five trailerite friends.

"Gumarsol, facing a possible $100 fine, protested that the ordinance had no bearing, since his trailer was not a dwelling but an automobile accessory. 'I'm not concerned over the fine,' he said. 'I'm interested in fighting this attempt to strike at the freedom of trailer residents."

'The importance of the case impressed Justice Arthur Green, who calls himself 'just a common, ordinary hayseed justice of the peace.' He demanded briefs from counsel and finally, last week, he handed down his decision [quoted above].

"Undismayed, the champion of trailerite freedom authorized his attorney to appeal to the county court."

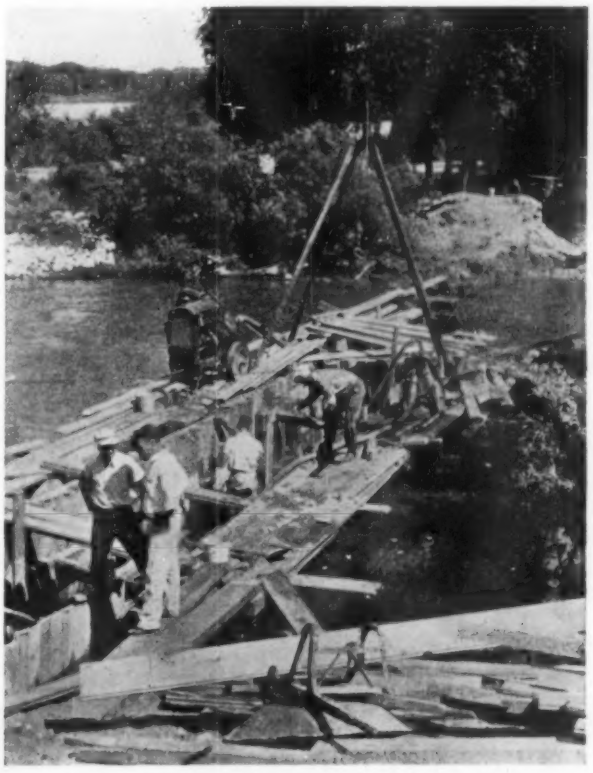
New Intercepting Sewer for La Crosse, Wisconsin

Winter Construction, River Crossing, and Other Features of This $600,000 Project

AS its part of the general clean-up program along the Mississippi River, La Crosse, Wis., has started the construction of an intercepting sewer along the river front, and on August 13, 1936, bids were received for the construction of a primary treatment plant to cost about $280,000, located on Isle la Plume in the Mississippi River, separated from the La Crosse shore by a narrow slough. The story of the construction of the first section of the intercepter in winter, the crossing of the La Crosse River in summer, and the continuation of the line toward the sewage-treatment plant site, has many interesting features.

Winter Construction

The contract for the first section of the sewer was awarded to Theo. J. Molzahn & Sons, Inc., local contractors, and the work continued through the winter and early spring. The frozen ground made the work in marshland easy because of the elimination of sheeting, but the water hazard in the trench led to the adoption of a special joint for the 18-inch cast iron pipe. Although this cost more than the original bell-and-spigot joint, the contractor was willing to absorb the added cost because of savings in other ways which offset this item.



LAYING PIPE BENEATH THE LA CROSSE RIVER

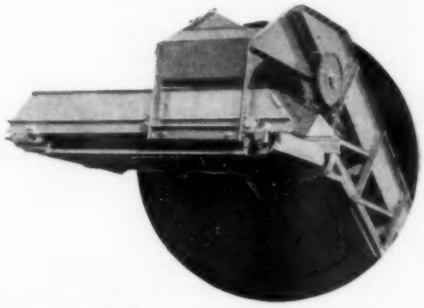
LAYING THE PIPE IN CLOSE QUARTERS

In all, 6,300 feet of sewer was laid, with 1,100 feet in swamp, under this contract. The contractor used 18-inch Mono-cast pipe with Doublex Simplex joints that could be assembled above ground and because of their flexibility could be lowered into the trench progressively. At a crossing under the tracks of the Milwaukee Road, a 36-inch corrugated culvert pipe was first jacked under the fill, and then the cast iron pipe was pushed through the larger pipe.

The contract required hand labor throughout the work, and at times as many as 100 men were employed on the winter work in two shifts of five hours each. PWA hours and wage scale were used. The pipe was lowered into the trench by hand, using two hand derricks. By this method as much as 480 feet of pipe was laid daily. The line was tested in 1,000-foot sections with water under 40 pounds pressure.

The contracts for the laying of the larger pipe downstream from the work just described were awarded to

Announcing the Barber-Greene *1937 Snow Loader*



Side Discharge Optional

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"Snow Insurance", a 24 page booklet, not only completely describes the 38-D, it covers the entire subject of snow removal, including pertinent newspaper clippings, U. S. Weather Bureau Snowfall tables, and snow removal costs.
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Thos. E. Woolley, also of La Crosse, who chose to use the same type of pipe and mechanical joint. He handled the trench by hand excavation, keeping as short a section open as possible, since most of his work was along the railroad and as close to the track as a trench could be excavated. Trains were run over the siding daily, so that especial care had to be taken in bracing the sheeted trench and also in the compacting of the backfill.

This same excavation was faced with another problem, namely, that the opposite side of the trench was along the walls of old warehouses used for storage for various commodities. The slightest failure of the foundations of these buildings would have resulted in considerable damage to the buildings. For this reason the contractor could not use water in his backfill for puddling, lest it might soften the ground under these foundations. Instead, he backfilled the trenches and carried the backfill as much as 3 feet above the ground surface and then applied water to the top of the fill.

A crew of 17 men hand-excavated the trench in this section for 24-inch pipe, hand-sledged the wood sheeting of 2 x 8-inch lumber with 3 x 12-inch wales and Simplex trench braces. The excavation went as deep as 17 feet adjacent to the track, and there was some seepage through the old riprap. This section was formerly stream bed and had been reclaimed from the river by fill and riprapping.

La Crosse River Crossing

The sewer is a force main for the first 6,000 feet, which was laid with 18-inch pipe. From the La Crosse River there is 6,000 feet of gravity main to the plant. Theo. J. Molzahn & Sons were the contractors for the river crossing. They drove tongue-and-groove sheeting to slightly above the normal dry-weather flow line of the river and kept the coffer reasonably dry with a Jaeger 6-inch centrifugal pump. A 2-inch Jaeger pump was used to provide water for jetting the sheeting as it was driven by a hand sledge.

The sewer project as well as the sewage-treatment plant is being constructed under the direction of the City Engineer, J. H. Barth. Jerome T. Kaminski was Resident Engineer-Inspector for PWA. Of the $600,000 required for this work, $270,000 was a grant from the Public Works Administration.

A Look Forward at Housing and PWA

Excerpts from an address delivered by Harold L. Ickes, Secretary of the Interior and Administrator of Public Works, at the annual dinner of the United States Conference of Mayors at Washington, D. C., November 17, 1936

TO the subject of housing we can now bring the accumulated experience of several years' operation of PWA's program. We may now consider the future of housing as a program improved, modified and perfected against the recovery background of 1937 and not the depression background of 1933. . . . We have financed seven limited-dividend housing corporations, which have proved to be highly successful, and we also entered upon a program of slum clearance, on our own account, as Federal projects. Fifty such slum clearance and low-cost housing projects have been undertaken in various parts of the country. The first of these, Techwood, is now operating in Atlanta, Ga. More are getting ready to open their doors to tenants, and we expect to have the entire lot in operation next year.

Where do we stand now so far as a permanent housing program is concerned? Our experience has shown us that housing is properly a municipal undertaking. The Federal Government was willing to blaze the way, and had PWA not initiated this program, slum clearance and low-rent housing in this country would still be the distant rose-colored cloud that it was in the decades preceding 1933.

The Wagner-Ellenbogen housing bill, passed last year by the Senate, definitely recognizes housing as a municipal responsibility. The Public Works Administration supported that bill. Senator Wagner recently declared that he will again introduce his housing bill and he has expressed the belief that this year it will be passed by the Congress. It is probably not necessary to call your attention to what President Roosevelt said in New York two or three weeks ago about his desire to have a housing program which will enable our families to live under decent conditions. You will recall that he stated that his administration would find a way to wipe out slums, and to provide proper housing for those families that now are unable, by reason of their small incomes, to live decently.

I hope that you Mayors realize that the resolve of this administration to set up an effective housing program offers a tremendous opportunity to you and your cities. But we must make up our minds as to what we want. The time is at hand for us to analyze the situation and determine what part the cities are willing to play in this new social drama.

The Federal Government should be willing to make loans and grants to cities in aid of low-cost housing. It can continue to give technical assistance and make available to municipalities the fruits of its experience during the last three years. It can go forward with a program of research, without which genuine low-cost housing is impossible—such research as could not be undertaken by individual cities. With its wider resources and with its greater opportunity for leadership, the Federal Government will be in a position to provide a great pool of valuable information for interested municipalities.

In order to qualify yourselves as partners with the Federal Government in this fine social enterprise, certain essential preliminaries must be attended to. Let me enumerate these:

1. In states where there is enabling legislation, but where local housing authorities do not now exist, they should be established. Because of municipal debt limitations and charter or state constitutional restrictions, a housing program can rarely, if ever, be underaken by a municipality unless a housing authority has been created.

2. In those states where there is no present legislation providing for local housing authorities, laws setting them up should be enacted. I understand that only twenty states now have such legislation.

3. In many cases the legal powers of housing authorities, when instituted, will have to be tested in the courts, and such tests should be sought at the earliest possible moment. This is especially important because it will probably be impossible to sell bonds of housing authorities until the courts have passed upon the validity of the laws under which the bonds have been issued.

There is another important point that I would like to make. A permanent housing program must be divorced from questions of relief and emergency legislation. I do not mean to suggest that relief labor cannot be used to advantage on housing projects. The contrary, rather. But I do mean that the housing program should be of a permanent nature, even although in the building of the projects labor may at times be taken from relief rolls.

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Modern Electric Light Billing

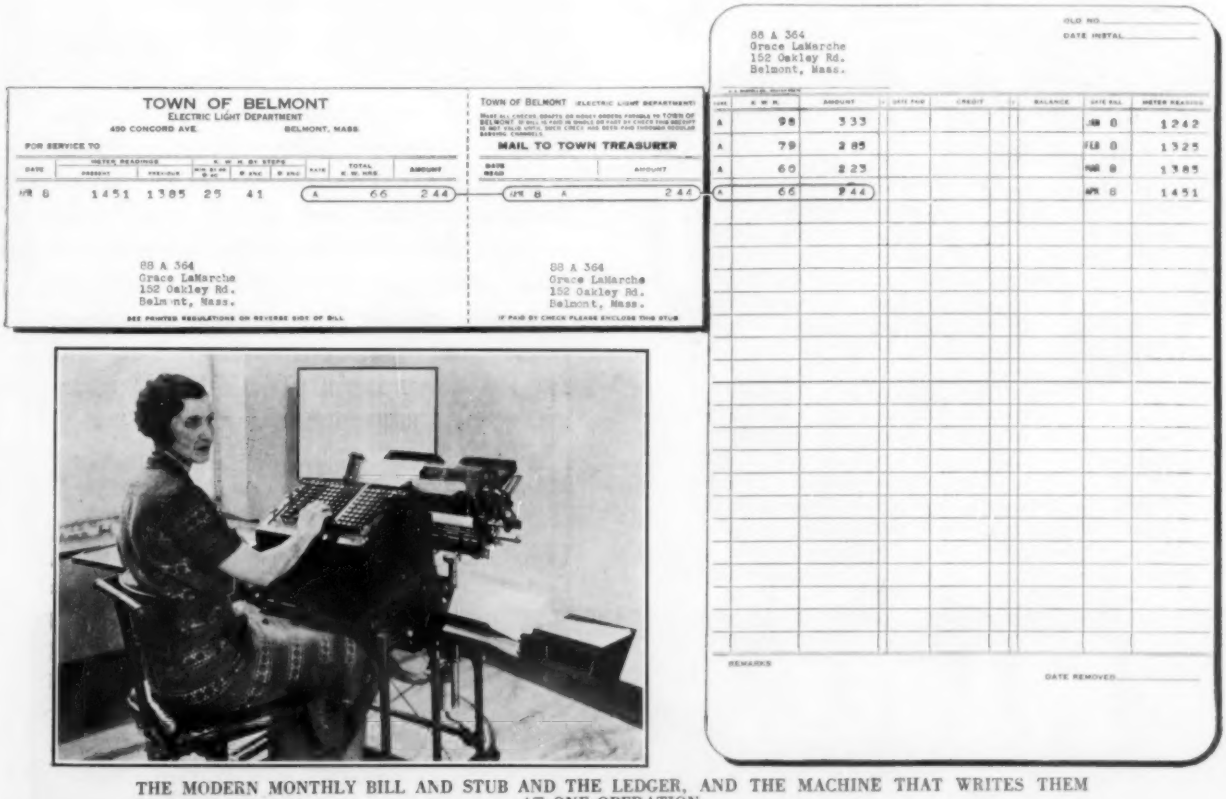
By E. P. TAYLOR
Manager, Municipal Light Department, Belmont, Mass.

THE first function of an electric department is to furnish satisfactory service and the next is to sell that service to the people who use it. One of our recent innovations is the Mercury-Mazda street lighting on Concord Avenue, described in this magazine last January. Since its installation no accidents have happened that could be laid to not having proper lighting on this two-way street.

This example of modern lighting has been of value to our town not only as a life-saving device, but as a means of first-class publicity as well. It has attracted the attention of visitors and through-motorists as well as of our townspeople. They are proud of having fostered this installation, and I believe that the Municipal Light Department has been the gainer thereby in increased local interest in our service and larger sales of kilowatt-hours. Since the depression we have made an 8 per cent yearly average of gain, purchasing 8,867,492 kwh in the last year, and I would say that some of the gain was due to the innovation of Mercury-Mazda street lighting on Concord Avenue.

Another innovation, of an entirely different character, but also tending to improve customer relations, is our new system of billing by machine. Gone is the old pen-and-ink bill, replaced by the neat, small, accurate statement shown at the top of the illustration. The old bills, rendered every two months, measured 6 x 12 inches, against 3½ x 10⅛ inches for the present monthly bill, including the stub. Belmont has adapted its billing machine to the bill and ledger plan. Under this plan the machine writes the bill (and stub) and ledger at one operation. Both forms contain original entries of figures, although the ledger is produced as a by-product of writing the bill.

Billing operation, briefly, is as follows: The date of the bill and the meter reading are set up on the keyboard of the Burroughs public utility billing machine, and a motor bar is depressed. Both the date and the meter reading print on the ledger (which has been inserted and aligned in the machine beside the bill) and automatically repeat-printed on the bill. The previous reading and the consumption are then entered. Owing to legislation recently enacted in the state of Massachusetts, it is necessary to show on the face of the bill the breakdown of the rate in steps of kilowatt-hours used. Originally the



THE MODERN MONTHLY BILL AND STUB AND THE LEDGER, AND THE MACHINE THAT WRITES THEM AT ONE OPERATION

Only a year ago, pen-and-ink bills twice the size were rendered every two months. The new way pleases customers and speeds city routine

The proverbial "ounce of prevention" applies 100 per cent to traffic safety. Give PREVENTION a big place in your efforts to reduce the accident toll in 1937. PREVENT violations—PREVENT recklessness — PREVENT accidents—by equipping your enforcement departments with more Harley-Davidson Police Motorcycles.

The new 1937 Police Models have many outstanding features to increase the efficiency of your traffic control squads. Circulating pressure oiling — roller bearing motors — double loop trussed frames—welded steel saddle-type tanks —large dial easily read speedometers—four speeds forward—tubular front forks —longer motor life—greater sustained horsepower—easier handling. Yes, and rugged dependability with LOW operating and maintenance costs.

A phone call to your nearby Harley-Davidson Dealer NOW will bring a new 1937 model for your inspection. Or write us for literature.

HARLEY-DAVIDSON MOTOR CO.
Department M Milwaukee, Wisconsin

HARLEY-DAVIDSON
The Police Motorcycle

machine was not designed to show this information, but it has recently been changed to provide it as required by legislation.

Errors Automatically Detected

An important feature of the machine is that in the event of an error in the method of computing the consumption or in indexing the meter readings and consumption, the machine locks. It will not print or accumulate until the error has been adjusted.

At this point the machine operator observes the rate chart, determines the amount of the bill and writes it on the bill along with any arrears the account may have. The amount of the bill is repeated on the stub which is attached to the bill. The kilowatt-hours and the amount are repeat-printed on the ledger, and the actual billing is completed.

As the machine goes about its job of producing bills and ledgers for each of Belmont's 7,000 customers, it automatically produces a continuous carbon copy of all bills and also accumulates totals necessary for proof purposes. Proof totals are printed on the register of bills. With their accuracy assured, the bills are ready for the mail.

Improved Service—Lower Rates

Billing is but one of many operations that the Belmont Municipal Light Department is equipped to handle in the modern manner. Advancements in the conduct of the business and in the improvement of electric service have, through the years, gone forward with the increased usage of current, while the rate has been lowered steadily. Today a family residing in a seven-room house can have electric light, and operate an electric range, a refrigerator, and a hot-water heater for an average cost of $11 per month.

Working a Township Quarry

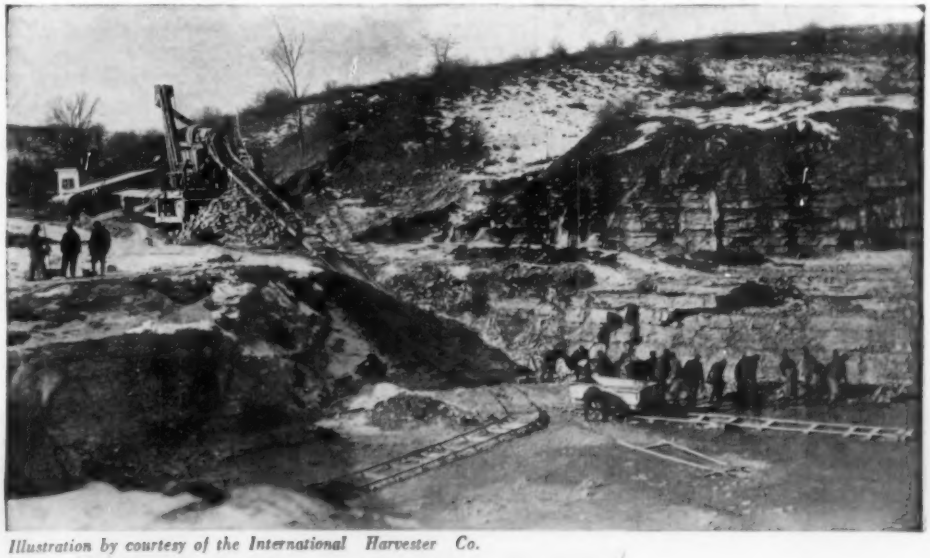
By H. T. REISHUS

THE Carthage Township quarry, Hancock County, Ill., has been producing crushed rock at an average cost of only 1.19 cents for fuel and oil since June, 1935. The township was operating a 10 x 20-inch Diamond crusher with a 28-foot elevator driven by an International PD-40 diesel power unit, which also hauls the cable cars up a 30-degree incline from the quarry floor to the crusher. The screens are 8 feet by 36 inches, and the crushed rock is from 1¼ inches down.

This quarry was operated throughout the winter months of 1935-36 with only temporary shut-downs because of cold and snow. In December, 1935, the crusher operated 137 hours and turned out 2,096 cubic yards of 1¼-inch rock, an average of 15.3 yards per hour. The crusher is rated only at 10 to 14 cubic yards per hour, but showed a better average for the entire month of December and had one record 4-hour run of 20 yards per hour.

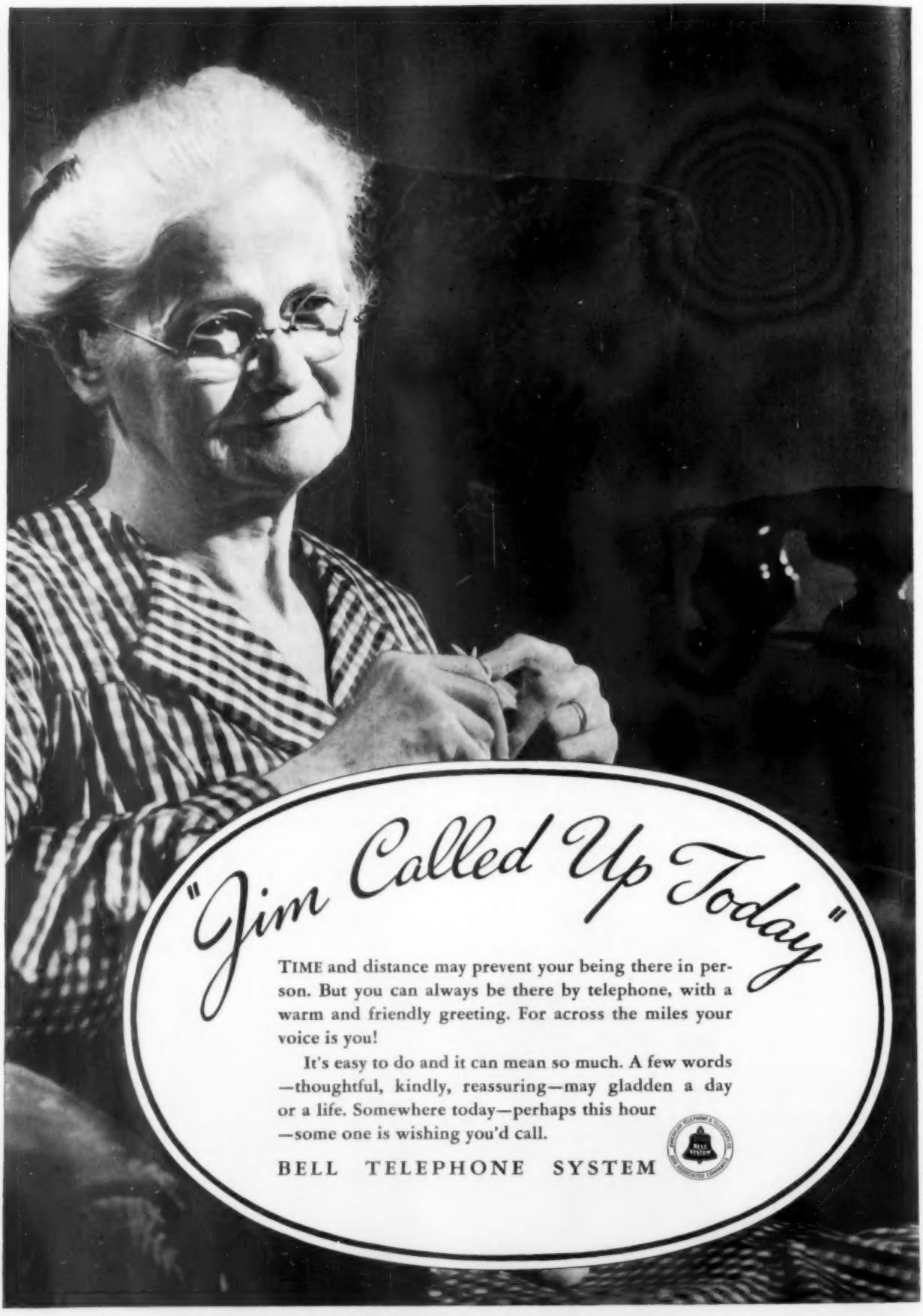
John Spangler, foreman in charge of the quarry, reports that the daily fuel cost saving over the gasoline tractor formerly used to operate this plant was sufficient to pay for the new power unit in about 500 working days. His cost summary compiled for the first five months' operation of the diesel power unit is as follows:

Total hours worked	567½
Total yards of rock crushed	5,610
Total gallons of fuel oil used	1,020
Total gallons of lubricating oil used	34
Gallons of fuel oil per hour	1.80
Gallons per cubic yard of rock	0.18
Cost of fuel oil per gallon	6.6c
Cost of fuel oil per cubic yard of rock	1.188c
Cost of lubricating oil per cubic yard of rock	.004c
Total cost of fuel and oil per cubic yard of rock	1.192c
Cost of fuel per 7½-hour day	.90c
Cost of gasoline for tractor formerly used, per 7½-hour day	$4.50
Saving per day (7½-hour)	$3.60



THE CARTHAGE TOWNSHIP QUARRY, HANCOCK COUNTY, ILLINOIS

Illustration by courtesy of the International Harvester Co.


"Jim Called Up Today"
TIME and distance may prevent your being there in person. But you can always be there by telephone, with a warm and friendly greeting. For across the miles your voice is you!
It's easy to do and it can mean so much. A few words —thoughtful, kindly, reassuring—may gladden a day or a life. Somewhere today—perhaps this hour —some one is wishing you'd call.
BELL TELEPHONE SYSTEM

Repairing City Streets Carrying Through-Traffic

Four Federal Routes Meet in One City Block in Phoenix, Arizona

THE increasing traffic, both local and foreign, which has passed through Phoenix, Ariz., over U. S. Routes 60, 70, 80 and 89 led to the recent widening of this city street for a distance of four blocks and a general repairing of the surface. The pavement consisted of an old 2-inch bitulithic top on a 4-inch concrete base. Subgrade failures had caused cracks, which were cut out 6 inches or wider with the use of jackhammers and points.

Where the work required the removal of considerable sections of the surface paving because it had become checkered, the base was irregularly grooved with the points to give a good bond between the base and the patches. Where there were high spots caused by utility patches or other work, these high spots were burned off with a home-made heater, and the excess material was raked off.

HAND-LOADING CRACKED MATERIAL BEFORE REPAIRING A MAIN STREET OF PHOENIX, ARIZONA

The heater used by the Arizona Sand & Gravel Co., contractors for the work, consisted of one-half of an oil drum, cut through from head to head, and inserted into it along the long dimension was a half-section of pipe holding the commercial propane burner which provided the heat for melting the surface of the pavement. In spite of the fact that this heater would cover only a very small area at one time, it proved effective, for the high spots to be taken off were quite small. It was found at first that the outfit would not work when placed close to the pavement. This was caused by the lack of air to permit complete combustion of the gas. The half-drum was then mounted on four legs to hold it off the ground so that the burner could breathe.

Patches

When the widened cracked areas and the patching areas had been cleaned thoroughly with a broom, the edges were painted with LRM Bitumuls, a slow-breaking road-mix emulsion, to permit a tight seal against the entrance of water between the old and the new material. A plant-mix patching material with maximum 2½-inch aggregate for base patching, and 1¼-inch material for top patching, and made with a 50 to 60 penetration asphalt, using 5 per cent asphalt for the top mix and 4½ per cent for the base mix, was hauled to the job by truck.

The hot-mix was spread and tamped by hand in 2½-inch layers. The patches, some of which covered as much as half the roadway for half a block because of the widened sections, were rolled with a 1-ton Austin 3-wheel roller for the base, and an 8-ton Buffalo-Springfield tandem on top. The contractor was required to paint the entire base course with the LRM Bitumuls when putting new top on old bituminous base.

This work was done betwen 3rd and 7th Avenues in Phoenix, on Van Buren Street, by the Arizona Sand and Gravel Co. of that city under contract with the Arizona State Highway Department for which George E. Lang was Resident Engineer under R. C. Perkins, District Engineer.

States Report Nearly a Billion in Motor-Vehicle Taxes in 1935

Motor-vehicle users paid special state taxes amounting to $950,971,000 in 1935, according to reports of state officials to the Bureau of Public Roads of the U. S. Department of Agriculture. Of this amount, $761,555,000 was allocated for highway purposes and constituted by far the largest source of highway revenue. State highways received $522,150,000, local roads and streets were allotted $238,134,000, and $1,269,000 went for miscellaneous highway purposes. Collection and administration costs amounted to $31,761,000. The taxes reported are: on motor-vehicle registration, $318,748,000; state taxes on gasoline, $619,802,000; and state motor-carrier taxes, $12,421,000. Other taxes paid on motor vehicles and garages as property and on the businesses of motor carriers are not included.

A total of $147,142,000 was diverted to non-highway purposes, $86,638,000 going to general funds, $16,925,000 for relief, $30,773,000 for education, and the remainder miscellaneous.

BEFORE completing your 1937 road plans, talk your problems over with the Tarvia field man. He represents America's oldest and most experienced manufacturer of coal-tar road-building materials. His special training plus your own knowledge of local conditions may result in more miles of good road on next year's budget. Tarvia types combine ease, economy and speed in construction and maintenance operations—assure the maximum mileage of durable, easy-riding, skid-safe highways from road funds available. Phone, wire or write our nearest office.

Marquette-Negaunee Road, Marquette County, Michigan. Tarvia since 1918. Highway guard rails and a traffic line have been added but the Tarvia road is as smooth, easy-riding and skid-safe today as it was eighteen years ago.

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How Los Angeles Purchases

By M. C. BIRDSALL
Assistant Purchasing Agent, Department of Supplies

LOS ANGELES was one of the first cities in America to appoint a purchasing agent. The position was created in 1911.

The Department of Supplies as it exists today was provided for in the new city charter which became effective on July 1, 1925, and was created by city ordinance. This ordinance states that the Department of Supplies shall consist of the Purchasing, Store, Multigraph, and Salvage Divisions, and shall be under the management of the purchasing agent.

Many of the larger departments have either mimeograph or multigraph machines to take care of their needs, and since the Printing Bureau of the Police Department can efficiently care for the remaining demands for this class of service, our Multigraph Division was merged or absorbed by that Bureau.

The Department of Supplies is one of the few departments of the city not having a commission as its head. It is directed by the purchasing agent of the city of Los Angeles, who is responsible directly to the city council and to the mayor. He is appointed by the mayor from the civil service eligible list, and the appointment must be approved by the Council.

The organization of the Purchasing Division consists of the purchasing agent as its head, one assistant purchasing agent, who is also the head of the Purchasing Division so far as routine matters are concerned, two general clerks, two stenographers, and one messenger.

All requisitions received are classified into four groups as to the estimated value: (1) less than $500; (2) $500 to $1,000; (3) $1,000 to $2,000; (4) $2,000 and over. All are referred to the assistant purchasing agent for segregation and distribution.

Those in Class 1 require no contract and are referred to a clerk to attach proper specifications and a list of vendors, and are passed to typists for preparation of bids. Of this group, those specifying material or supplies required by a department for immediate delivery, owing to some extreme emergency, are referred to another clerk, with a notation as to the proper source of supply attached, to secure telephone quotations. These are given special and prompt attention.

Class 2 requisitions are referred to a clerk to attach specifications, if they are not already properly stated, and a list of vendors, and are passed to typists for preparation of bids. Those that are of a special nature or that require samples to be submitted to be passed on, are handled by the assistant purchasing agent.

Class 3 requisitions are taken care of by the assistant purchasing agent.

Class 4 requisitions are referred to the purchasing agent. They are returned to the assistant and then given to a stenographer to prepare the notice inviting bids, embodied in which are the specifications, a bond form for 10 per cent of the amount of the bid, and an affidavit of noncollusion form.

Bid Procedure

All bids and specifications are assigned a serial number and are mailed, showing on them a definite closing date and time. Upon their return, they are assembled according to the number assigned them, and attached to the requisition to which they pertain.

All bids and requisitions assembled are referred to the purchasing agent so that he may be kept fully advised of all the material and supplies being bought, and also the vendors to whom bids were sent, thus having a control over all materials and supplies purchased. They are returned to the assistant purchasing agent for segregation and distribution for the purpose of award.

Bids under $1,000 are referred to a clerk for check, comparison, and award to the lowest responsible bidder complying with the specifications. Of this group, those tht are of a special nature or have samples submitted upon request for inspection, testing, and to be passed on, require the attention of the assistant purchasing agent. Conforming to charter requirements, all bids so awarded having a total of more than $500 require only the signature approval of the purchasing agent.

Proposals between $1,000 and $2,000 are checked, compared, and awarded to the lowest responsible bidder complying with specifications, by the assistant purchasing agent. They are also referred to the board or department for which the purchase is being made, for approval, or in lieu of the latter, to the Director of the Bureau of Budget and Efficiency. In the event of a recommendation required, owing to some technical or intricate problem which the proposal contains, all departments must show their signature of approval on the face of the bid. However, all bids within this group are so awarded after first having required the signature of approval of the purchasing agent on the bid accepted.

The Formal Bid

All inquiries or bids having a total of more than $2,000 constitute a "formal bid" and are publicly opened and read by a representative of the Purchasing Division on the closing date and time published. All bids so received are referred to the board or department for which the purchase is being made, for recommendation and signature of approval. In lieu of the latter, except in the case of the Board of Public Works, they may be referred to the Director of the Bureau of Budget and Efficiency. They are then returned to the purchasing agent for his consideration and signature of approval.

The purchasing agent requests the city attorney to draft a contract on the accepted proposal and return same to the purchasing division. A contract number is assigned to it by the city clerk's department.

A purchase order is prepared by typists for all bids awarded. All purchase orders require the signature of the purchasing agent.

Addressograph
TRADE MARK

brings speed, accuracy and economy into many municipal departments

NOW, for little more than the cost of a typewriter, any municipal, county or state department can have the efficiencies of this new electrically-operated, name- and data-writing Addressograph.

IT PRINTS — From light-weight typing units it prints names, addresses, facts, figures and other frequently-used and repeatedly-rewritten data on payrolls, pay checks, service bills, tax rolls, tax bills, license notices and certificates, and a wide variety of other forms and communications.

IT SELECTS — By means of removable metal tabs, the typing units can be classified into many divisions for selective use in printing on forms or addressing.

IT LISTS — A listing device automatically spaces and lists names or data on plain or ruled sheets, such as payrolls, tax rolls and similar office records.

IT DATES — A simple attachment automatically inserts dates on bills, checks and other forms when names and data are being printed.

IT NUMBERS — Another device automatically numbers checks, certificates and other forms at the same time printing is done.

IT SIGNS — Facsimile signatures can also be affixed to all kinds of forms . . . checks, certificates, communications.

IT COUNTS — A counting attachment visibly registers the number of forms imprinted as a check against progress of work . . . against postage required . . . against list totals. Accurate counts are important.

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Without attachments
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A new booklet describing the Class 900 Addressograph and many of its uses will be mailed on request. Write to

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ADDRESSOGRAPH-MULTIGRAPH CORPORATION
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Office records kept are as follows: files for requisitions, bids, purchase orders, contracts, transmittal of all purchases, a card index price record, and material specifications.

Awards Based on Samples

The procedure of an award when samples have been requested, and the determining factors entering into such an award, will now be described.

There are four important factors to be considered: quality, price, terms, and delivery. As an illustration, we will consider one of the items of the playground supplies group—footballs. To begin with, we have received bids from five principal sporting goods firms, and, bear in mind, we have specifically stated on our request the following: Do not bid on, or submit any sample of ball not meeting specifications. On inspection, we find approximately 24 or 25 footballs to be examined, ranging in price from $3 to $9 each.

The specifications call for a ball to be of cowhide cover, back and side leather, 4-piece construction, segments 14 by 5½ inches, lock stitch with heavy linen thread, double lining, 22-inch circumference, 14- to 15-ounce weight, and of valve type construction.

Upon investigation we find we have received bids on balls with traces of neck leather in two or three of the segments, signified by creases in the leather approximately 2 inches wide running diagonally across the segments, that could not be removed in the tanning and finishing process. Scratches are found on some segments, which are scars from wounds caused by barb wire. The weight of the balls will average 11 to 13 ounces—they are underweight. The circumference will run rather uniform. Although the valve type ball is preferred, or rather is more popular now, a tube valve type ball is acceptable.

The general shape, workmanship, and type of service the ball will be subjected to must be taken into careful consideration, together with the four important factors previously mentioned, in selecting the proper football.

The same thought and careful consideration must be given to examining all the many pieces of equipment in this group, such as basketballs, volleyballs, soccer balls, baseballs, playground balls, catchers' gloves, masks, boxing gloves, etc.

As another example, we will take an article entirely foreign to the previous group—a floor brush. There are many types of construction in this group, all of which can be made up to specifications by the manufacturers as to the per cent of hair, bristle, or fiber which the brush is to contain, the various lengths of the block, the number of knots, the size bit to be used, and the trim. The two-threaded handle holes are well standardized now as to size and thread.

The type of construction adopted (for one of several sizes) for a general utility brush requires 50 per cent hair and 50 per cent fiber, 18-inch hardwood block, 192 knots, using a 7/32-inch bit, with a 3-inch trim.

Of the samples submitted for inspection, it is not a difficult matter to determine whether or not the block is made from the proper wood, or whether it has the proper length and the proper number of knots; and the size of bit used can be measured. The difficulty and problem come in determining the proper mixture of hair and fiber asked for.

A brush may appear to be satisfactory, still the casing or outside row may be practically all hair and the center stock practically all fiber. A brush of this construction, we believe, is made for that express purpose—appearance.

If the trim asked for is 3-inch, the hair or fiber used should not be less than 7 inches long. The fold on each side of the staple used to hold the material in the block should be 3 inches. However, if one side of the tuft is 3 inches and the other is 2 inches, there is an inch of material saved by the manufacturer, and that brush can be sold cheaper. If this brush should be accepted, we are not receiving what has been asked for—a (full) 3-inch trim. To the trade this practice is called "stretching."

Fiber can be colored and sized, giving it a sheen like that of hair, and when mixed with hair, the presence of fiber is hard to detect. It can be detected, however, by pulling out several tufts throughout the brush and burning the ends. Fiber will burn away to an ash, hair will curl as far as it is burned, forming a ball, and by placing it under a magnifying glass one may determine the approximate percentage of hair and fiber used. This examination, together with the four important factors previously mentioned, is the method employed in selecting the proper brush. When a hair and bristle mixture is asked for, it is more difficult to determine, since the two materials look so much alike. The "burn test" in this case produces the same results, but the bristle can be detected on account of its split or flag ends.

Occasionally, bids will be received on certain material, and an alternate will be specified at a lower price by some firm, which necessitates requesting samples to be submitted on all bids received. On inspection it is learned that the regular and alternate materials quoted by that firm are of the same quality and workmanship.

—From *Civic Affairs*, the bulletin published by The Civic Affairs Council, School of Government and the Department of Political Science, The University of Southern California.

Inventory and Earnings, Distribution System, Russell, Mass.

DURING the year 1935, the town of Russell, 1,237 population, sold 102,482 kwh of purchased energy at a cost of $5,407 to consumers, and of $1,420 to the municipal government, for power.

This total operating revenue of $6,827 compares with an expense of $6,255, leaving a net income of $572. Deducting an interest charge of $138 and $500 on the bond account leaves a loss of $66. Following is an inventory of the property:

Right-of-way	$100
314 poles* and 143,730 feet wires	8,411
184 consumers' meters	1,148
28 iive transformers	1,402
875 street lights	491
	$11,552

* 165 poles owned exclusively by town, and 149 jointly with the New England Telephone & Telegraph Co.

F. A. Helmes,
Manager, Municipal Light Department.

New Officials of AMA

ANDREW JOYNER, JR., City Manager of Greensboro, N. C., is the new President of the American Municipal Association, and Morton L. Wallerstein, Executive Secretary of the League of Virginia Municipalities, is the new Vice-President. Besides the President and Vice-President, members of the new Board of Trustees are: John G. Stutz, Executive Secretary of the League of Kansas Municipalities and immediate past President of AMA; Clarence C. Ludwig, Executive Secretary of the League of Minnesota Municipalities; E. E. McAdams, Executive Secretary of the League of Texas Municipalities; S. S. Kenworthy, Executive Secretary of the New Jersey State League of Municipalities; Kenneth J. McCarren, member of the Board of Assessors, Detroit, Mich.; and Clifford W. Ham, Executive Director, American Municipal Association.

BUDGET CONTROL

RECORDS ARE UP-TO-DATE AND IMMEDIATELY AVAILABLE WITH BURROUGHS BUDGETARY ACCOUNTING MACHINES

Keeping within appropriations is an important problem which confronts those responsible for expenditures of municipalities, schools, hospitals and other public institutions. Recent modernization of municipal accounting has been due to an increasing demand for more accurate and detailed reports of expenditures. Intelligent budget planning requires accurate comparative detail of previous years' expenditures. Current budget control demands daily knowledge of appropriation balances.

To facilitate municipal budget control, Burroughs offers a wealth of experience gained through years of activity on municipal accounting problems, as well as new machines, features and applications which speed and simplify the work.

The local Burroughs office is fully qualified to discuss these new developments with you, and to show you how other municipalities are using them to advantage. For complete information, telephone the local Burroughs office, or mail the coupon.

Burroughs

Governmental Division, Burroughs Adding Machine Company
Detroit, Michigan

Without obligation, send me complete information about the newest mechanical equipment for handling the accounting problems checked below:

Tax Accounting ☐ Budgetary Control ☐ Fund Accounting ☐ Stores Records ☐ Payroll and Check Writing ☐
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Forward Steps

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Toledo Steps Forward in Good Government and Industrial Peace

TOLEDO, OHIO.—Visitors to the 42d annual meeting of the National Municipal League, held in Toledo, on November 16 and 17, found a city riding high on a wave of revival. They found Toledo assured and confident, in sharp contrast to the feeling of hopelessness that permeated the city two years ago after it passed through a series of disillusioning events, including the collapse of local banks and a wave of serious strikes.

Chief factor contributing to this change of spirit has been the improvement effected by its new city manager form of government which went into the City Hall at the beginning of 1936. Progress made under City Manager Edy and the new nine-man City Council was the chief rea son why the National Municipal League selected Toledo as its 1936 convention city.

A second important element that has aided the city in its rapid comeback has been the unique Toledo Industrial Peace Board, first established in July, 1935. This impartial mediation board, composed of industrialists, labor leaders and citizens at large, has maintained labor peace, and has made progress toward solving some of the difficult issues of industrial relations, common to every manufacturing center.

City Manager Government

Citizens of Toledo have found that city manager government has not cost less, but that it has delivered more for the taxpayer's dollar. Operating functions will cost taxpayers about $200,000 more than in 1935. Extensive waterworks improvements may also add about $1,000,000 of expenditure, but those funds come out of the utility revenues and have no real relation to tax-supported agencies.

John N. Edy, City Manager, has devoted much attention to building morale in all departments of the city. He has operated under a strict budget control, and in 1936 Toledo, for the first time since 1930, will have sufficient income to support all appropriations. Contrast this with the general fund overdraft of $5,000,000 accumulated by annual deficits of previous governments.

Politics has been eliminated from the City Hall. Career men have been placed in charge of various operating departments, eliminating politicians. New officials have gone to work in earnest, knowing that no part of their energy need be devoted to any political activity. All employees are being made to feel that city government work is as honorable as any other calling.

City trucks are now owned by the city, and a source of largess to politicians in the form of truck rent has been cut off. No fire apparatus had been replaced for the last six years, and now six new pieces are being acquired. Neglected streets are being repaired, city offices have been centralized, and a troublesome traffic problem is being attacked with a citizen commission and a competent traffic engineer. Garbage collection and street cleaning are motorized.

City credit has been vastly improved. About $3,000,000 of bonds of future maturities are being refunded, so as to reduce interest from 6 to approximately 3 per cent.

Industrial Peace

To date, the Toledo Industrial Peace Board has helped to solve nearly 70 developing labor troubles in all types of industries, many outside the automotive field, and has kept the wheels of industry turning before difficulties got to the strike stage. In about 90 per cent of cases, this method was successful in averting any interference with production. Sporadic difficulties in a few other plants have been recorded, but few have interrupted the steady flow of parts and supplies to the auto makers.

In the formation of this peace plan, Toledo has experimented and has led the way for other cities to follow. The plan was originated by Edward F. McGrady, Assistant Secretary of Labor, who picked Toledo as the place to work out this tremendously interesting experiment.

"The Toledo Peace Plan" board consists of eighteen citizens—five drawn from the officers or ranks of organized labor, five from the leaders of industry, and eight citizens at large. In the latter group are a Catholic priest, a Rabbi, the city's largest retailer, a welfare director, two lawyers, two judges.

To the attention of this board can be brought, by either party, the facts in a labor controversy. The board can advise and takes all possible means for conciliation. If arbitration is demanded or seems best, it is possible to use as many members of the board as needed or desired.

Owing to the many requests made by other cities to the government for the full-time services of experienced mediators, the Department of Labor was forced to withdraw the executive secretary sent to Toledo. Faced with the lapse of such effective mediation machinery, the City Council decided to finance the operations of the board and employ a full-time secretary for the remainder of 1936. Edmund Ruffin, a newspaper man of high standing and a keen student of the local labor situation, was selected to act as director of the board. Success of the board during the past year makes its continuance as a logical function of the municipal government almost a foregone conclusion.

JOSEPH K. CLOSE.

Selecting Without Civil Service

WE do not have civil service in the city of Hackensack, for which I am grateful, as I do not feel that civil service has any place in a municipality of this size (24,000 population). However, in order to select policemen and firemen, we do have a system which is designed to eliminate all possible chance of suggested discrimination, or attempt on the part of certain people to use influence. The plan used is as follows:

The City Council appoints an examing board consisting of the Director of Public Safety and two citizens. This board supervises the examinations that are held, and makes its report to the city manager, who in turn makes the appointments according to the list submitted by the examining board.

The written and physical examinations for policemen are conducted by New Jersey State troopers detailed for the work by Colonel Kimberling. The written and physical examinations for firemen are conducted by the National Board of Fire Underwriters. The medical examinations are given by two physicians and an ear, eye and throat specialist.

After the results of the examinations are known, the qualified list is presented to the examining board. The men are then interviewed, individually, by the examining board and given an oral examination along general lines, to determine, if possible, the men best qualified for the position open.

This plan is used for promotions as well as for new men. We have used this manner of selection very successfully on two different occasions within the past year, and have found, thus far, that there is absolutely no curbstone talk relative to the selections made. We are naturally very appreciative of the services rendered by the citizen members of the examining board, and feel that the system we are employing removes all possible chance for criticism and at the same time produces the best-qualified men possible to get.

W. M. RICH,
City Manager, Hackensack, N. J.

IF WE'RE GOING TO TEST CARS, LET'S GET EQUIPMENT THAT TELLS THE FULL TRUTH . . . EVERY TIME . . . NOT JUST ONCE IN A WHILE!

"Right!"

SEATTLE • • OMAHA • • CINCINNATI
KNOXVILLE • • BILLINGS • • MIAMI
PORTLAND • • the list grows
longer month by month!

LEFT: *Tests each brake separately by full wheel revolution under electric power . . . shows total stopping ability . . . shows up "out-of-round" drums. TESTS TRACTOR AND TRAILER TRAINS with utmost accuracy.*

RIGHT: *Testing wheel alignment and toe-in, precisely and quickly. Shows exactly what work needs to be done. Nothing left to guesswork or estimate with Bendix test equipment.*

Municipal car testing is a splendid safety move. Properly handled, it cuts down accidents sharply and swiftly. But it's a needless bother and expense for a city to go to, unless the tests really are reliable.

Bendix, pioneer sponsor of "Street Safety by Prevention," advances this thought in no spirit of criticism, but by way of constructive cautioning. *Don't* expect light-duty, cheap equipment to give you either accurate readings, speedy handling or long life. Buy good, precision testing devices and avoid the bickerings and the natural public disapproval of unreliable, "never-twice-the-same" testing!

Bendix Civic Safety Clinic Equipment is *positively and consistently accurate*. It is fast. It is simple. It is very sturdy. It is guaranteed to be exactly as represented. It is very reasonable in price. Most car factories use Bendix chassis testing equipment for final new-car checkover. It covers brakes, steering, headlights, wheel alignment and as much in addition as you care to check. Fill out and mail the coupon TODAY.

BENDIX

CIVIC SAFETY CLINIC Equipment

BENDIX PRODUCTS CORPORATION
Subsidiary of Bendix Aviation Corporation
401 Bendix Drive, Dept. A-12, South Bend, Ind.
Send me at once full details about Civic Safety Clinic Equipment, prices, operating p'an, etc.

Name.....
Address.....
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Business or Profession.....
City Official (title) ☐.....Dea.er ☐

PRINTED IN U.S.A.

A Notable Exhibit of Municipal Services

MEMPHIS, TENN.—Municipal services were featured by the Memphis city government in an exhibit at the Mid-South Fair held in the city September 14-19. The exhibit occupied two large booths, aisle space, and 104 feet of wall. Fire, police, welfare, schools, parks, health, libraries, public works, and public utilities were represented by photographs, models, and objects. The exhibit was arranged by the Municipal Reference Library with the cooperation of city departments.

A large replica of a silver dollar, four feet in diameter, was the center of interest as the taxpayer's dollar, divided by red lines with labels showing the distribution of tax money among city services.

Many of the 250 photographs showed phases of government activity with which the average citizen is unfamiliar, such as the large farm on which the city raises food for relief purposes, views behind the scenes in police work, and glimpses into child life in the modern classroom. Other subjects ranged from newly paved streets to the public health nurses going down the City Hall steps to start their day's work.

Among the objects shown were fire-fighting tools, police machine guns and casts of footprints, a police radio broadcasting, a fire-alarm system in operation, cans of food put up by the welfare cannery, toys made by WPA workers for poor children for this coming Christmas, the model of a school building, a model of a playground, a large cage of parrakeets from the Zoo, an animated map of parks and playgrounds, and miniature pools with live minnows and mosquito larvae to demonstrate malaria control. Besides various booklets and a special leaflet describing the exhibit, visitors received souvenir fingerprints in the police section.

At the front center of the booths, "City of Memphis" glowed in blue neon, and a large picture of the city's skyline and riverfront bore the title "A Story of Progress—Made Possible by Taxes." The Park Commission supplied numerous plants and flowers to bank every corner of the exhibit.

The Fair had an attendance of 230,000 and the city's exhibit was crowded. On Children's Day, all public school students were instructed by their teachers to see the municipal show as part of their civics course.

RALPH PICARD,
Commissioner, Department of Public Utilities, Grounds and Buildings.

ABOVE—DIVISION OF THE MEMPHIS TAX DOLLAR; BELOW—THE MEMPHIS FIRE DEPARTMENT EXHIBIT

Thirty-Five New Tennis Courts Constructed in Trenton Playgrounds

TRENTON, N. J.—The recent construction of 35 new asphalt-surfaced tennis courts in different playground areas in Trenton was finished in time for use in early fall. With the completion of these courts, Trenton joined the long list of cities in California and other states throughout the country which have taken the initial step to eliminate the future expense of maintaining clay tennis courts.

The Director of Public Works and Service in Trenton, Joseph E. English, who planned the new tennis courts, decided to use hot mixed asphalt surfacing, similar to that used on important sheet asphalt thoroughfares, a type which has proved to be one of the smoothest and most desirable for tennis courts. This surface is resilient, a quality of special importance when court areas are used by players for long periods. Such courts are not only clean, but free from dust. They are firm, which makes for a fast game. They have the further advantage of being durable, smooth, easy to repair and non-glaring. Because they dry rapidly, asphalt-surfaced courts are ready for use a short time after a rain.

The excavating and foundation for the tennis courts was done by WPA labor under the direction of P. N. Daniels, Federal Works Projects Engineer for the city of Trenton. A foundation consisting of 4-inch waterbound macadam was laid by WPA labor and then rolled. The Union Paving Co., of Philadelphia, was awarded the contract for mixing and laying the binder and wearing surfaces on these courts, at a price of $1.59 per square yard; and the mixtures were made at the company's plant in Trenton, assuring a more uniform quality than if they had been prepared on the different jobs at various times. Inspection of the bituminous mixtures used for the binder and wearing surface was made under the direct supervision of L. D. Long, of the Jersey Testing Laboratories, in Newark. A binder course consisting of crushed stone, sand and Trinidad Lake asphalt cement was mixed hot, hauled to the job and compacted to a thickness of 1½ inches. A wearing surface composed of sand, crushed stone and stone dust made with Trinidad Lake asphalt cement of 60 to 70 penetration was also mixed hot, hauled to the job and compacted to a thickness of 1¼ inches with heavy rollers until the wearing surface was absolutely level.

A total of 23,706 square yards of surfacing was laid on the 35 courts in the 5 different playground areas throughout the city. The largest number of courts were installed at the Trenton High School athletic field at Hamilton Avenue and High School Drive. Here 15 courts were constructed, having a total area of 10,666 square yards. Nine courts were constructed in Cadwalader Park in the northern part of the city. At Lamberton Park four courts were built. Three courts were also constructed at the Stadium

A BRICK SURFACE WILL PAY FOR ITSELF OUT OF SAVINGS IN A *Short Time*

"Good roads pay for themselves" was the battle cry under which the ation lifted itself out of the mud decade and a half ago. It has roven itself to be true.

The excessive costs of gas, tires nd lost time of the "mud era" have een largely corrected. But there is ill room for important savings by ssening the present day cost of avement up keep and replacement.

esists Weather Damage

he *rate* at which a well-aveled highway pays for self increases as upkeep is ssened. The total profit of the highway is increased by giving it longer life.

A brick pavement is generally conceded to have the longest life and the lowest upkeep. Common observation: many a veteran brick street rides as well and looks better than other types from 20 to 30 years younger. The reason is because weather cannot start damage which traffic hammers into final destruction.

Unequalled For Riding Comfort

Modern manufacture of brick and modern engineering and construction methods give unequalled riding comfort and safety.

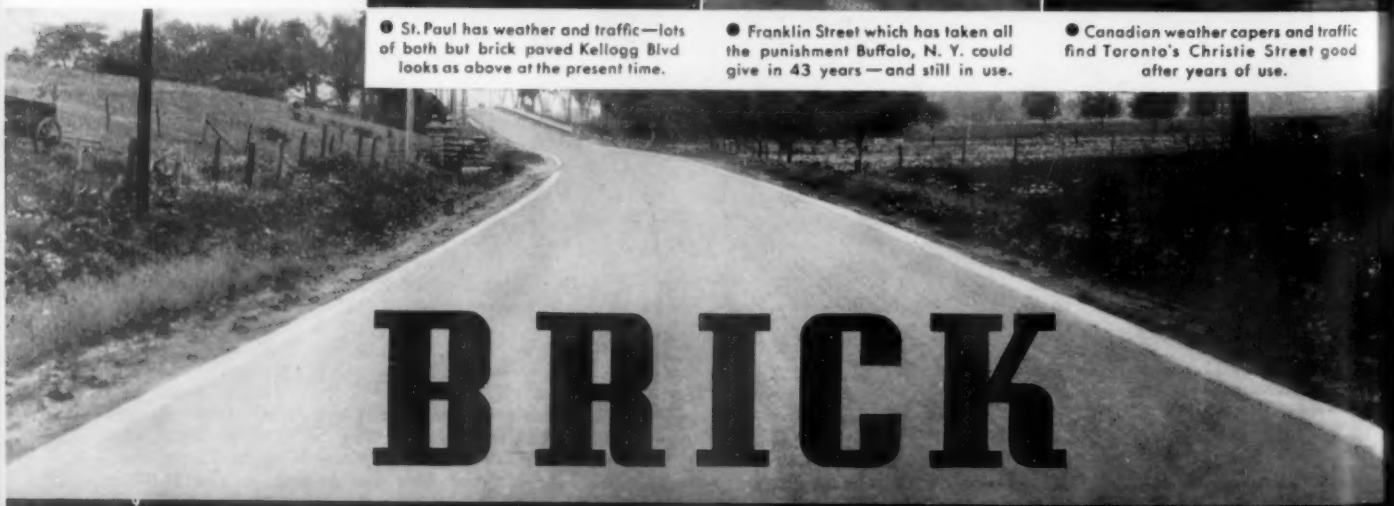
Build new jobs with a brick surface. Resurface failing slabs with brick—it's better and cheaper. National Paving Brick Association, (Affiliated with Structural Clay Products, Inc.) National Press Building, Washington, D. C.

Exhibitor A. R. B. A. Convention, New Orleans, January 11-16, 1937
31st Annual Meeting National Paving Brick Association, Detroit, January 27-29, 1937

● St. Paul has weather and traffic—lots of both but brick paved Kellogg Blvd looks as above at the present time.

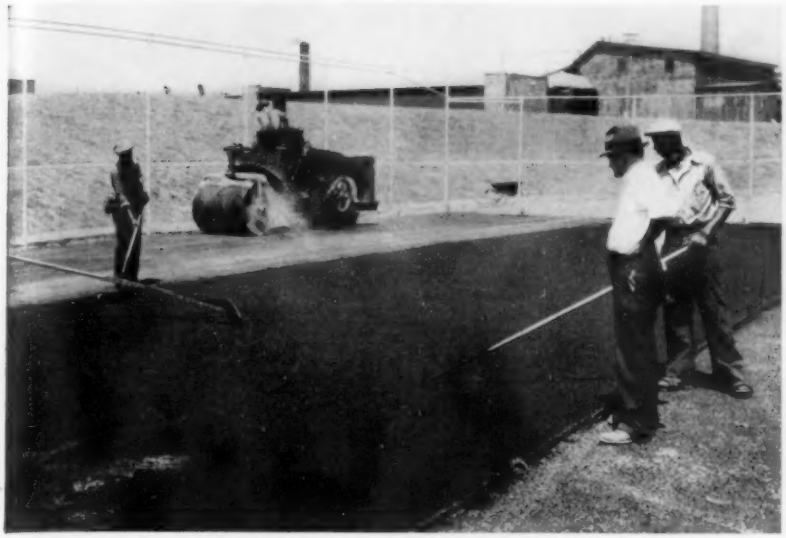
● Franklin Street which has taken all the punishment Buffalo, N. Y. could give in 43 years—and still in use.

● Canadian weather capers and traffic find Toronto's Christie Street good after years of use.



BRICK

OR NEW CONSTRUCTION OR RESURFACE JOBS



ROLLING WEARING SURFACE OF TENNIS COURT IN STADIUM PLAYGROUND, SWEETS AVENUE AND RESERVOIR STREET, TRENTON, N. J.
The triangular section of the court at the right of the picture shows the binder course, while the middle back section shows the appearance of the wearing-surface before being rolled

Playground, Sweets Avenue and Reservoir Street.

Galvanized iron fencing, hot dipped after forming, ranging from 10 to 20 feet in height, was used at the ends, sides and partitions of the courts. Iron posts fitted with ratchets, which make for ease of tightening nets, were used on all the courts.

R. C. HEATH.

Chambers of Commerce and the Tax Problem

SPEAKING at the annual convention of the National Association of Commercial Organization Secretaries in Omaha last month, Welles A. Gray, of the Finance Department of the Chamber of Commerce of the United States, urged both vigor and discrimination in the attitude of chambers of commerce and other commercial organizations towards problems of national, state and local taxation. After summarizing the present situation as to expenditures, revenues and budgets, Mr. Gray said in part:

"All this points to the necessity of continuous vigilance by business organizations if there is to be safeguard against excessive debt incurrence and extravagant spending, and if there is to be restraint upon the taxes that bedevil business concerns. Important as it was during the depression that commercial organizations be active in careful scrutiny of local expenditures and taxes, such activity is even more important today.

"In this activity, however, extremes should be avoided. Blind budget cuts and heedless slashing of expenditures without regard to the necessity and value of many muncipal services may result in untold harm. In times of extreme emergency, when the doctrine of 'needs must' applies, a policy of cut for cut's sake may be justified as a temporary expedient, in the interest of maintaining essential services. In most situations, however, intelligent and discriminating appraisal of various proposed expenditures, whether for operation or for projected improvements, is the policy which brings best results.

"In the development of such a policy, a valuable leadership can be furnished by commercial organizations of this country. Indeed, to justify nation-wide activity upon tax problems by business groups, our movement should have a definite character of its own. Let it not be said that chamber of commerce activity upon tax problems is merely another protest against taxes, without constructive suggestion. Rather, this movement should be so able in its direction and so constructive in the proposals which are made, that all agencies within each community—official as well as private—will look to the local chamber of commerce as a body which is qualified to pass intelligent and impartial judgment upon tax and expenditure questions which may be pressing for decision."

Junior Chamber of Commerce to Educate on City Planning

A GIANT exhibition on city planning will be gathered from cities and towns all over the country through the Junior Chamber of Commerce of the United States in connection with the city planning show to be held in New York City in February, 1937. The New York exhibit will be sponsored by Mayor La Guardia's Committee on City Planning. Cooperation in this project, as announced in the *American Society of Planning Officials' News Letter*, marks the beginning of an educational program devised by the U. S. Junior Chamber of Commerce to promote the understanding of city planning by the business man and taxpayer.

Junior Chambers of Commerce in every city are invited to participate by preparing for the New York exhibition materials pertaining to what has been, is being or should be accomplished in the way of city planning in their respective localities. The material will be assembled and arranged in New York with the assistance of the Municipal Art Society and others. The exhibit will be held in the Hall of Education of the Museum of National History, beginning February 25, 1937.

It has been proposed that, following the exhibition, a part or all of it should be sent on tour as a loan to Junior Chambers of Commerce throughout the country. It has also been suggested that the whole exhibit, with any new material added on tour, might be returned to New York in 1939, to become an important part of the World's Fair.

William Exton, Jr., 135 Central Park West, New York, is in charge of the exhibition program for the U. S. Junior Chamber of Commerce.

New Officers and Directors of NACOS

AT the annual convention of the National Association of Commercial Organization Secretaries, held in Omaha, Nebr., last month, the following officers and directors were elected, to serve for the ensuing year:

PRESIDENT: Roland B. Woodward, Executive Vice-President, Chamber of Commerce, Rochester, N. Y.

VICE-PRESIDENT: R. W. Nelson, Executive Vice-President, Chamber of Commerce, Cincinnati, Ohio.

SECRETARY-TREASURER: M. D. Liming, Secretary, Chamber of Commerce, Boston, Mass.

DIRECTORS:

Harvey J. Campbell, Secretary, Board of Commerce, Detroit, Mich.
Daniel N. Casey, Secretary, Chamber of Commerce, Harrisburg, Pa.
James T. Daniels, Manager, Chamber of Commerce, Jacksonville, Fla.
Stanley C. Draper, Managing Director, Oklahoma City Chamber of Commerce, Oklahoma City, Okla.
William Dunkerley, Secretary, Chamber of Commerce and Civic Association, Pasadena, Calif.
D. Hodson Lewis, Secretary-Manager, Chamber of Commerce, Little Rock, Ark.
O. F. Lyman, Secretary, Association of Commerce, Peoria, Ill.
W. H. Wood, Secretary, Chamber of Commerce, London, Ont., Can.

It is expected that the volume of Proceedings will be available by December 10.

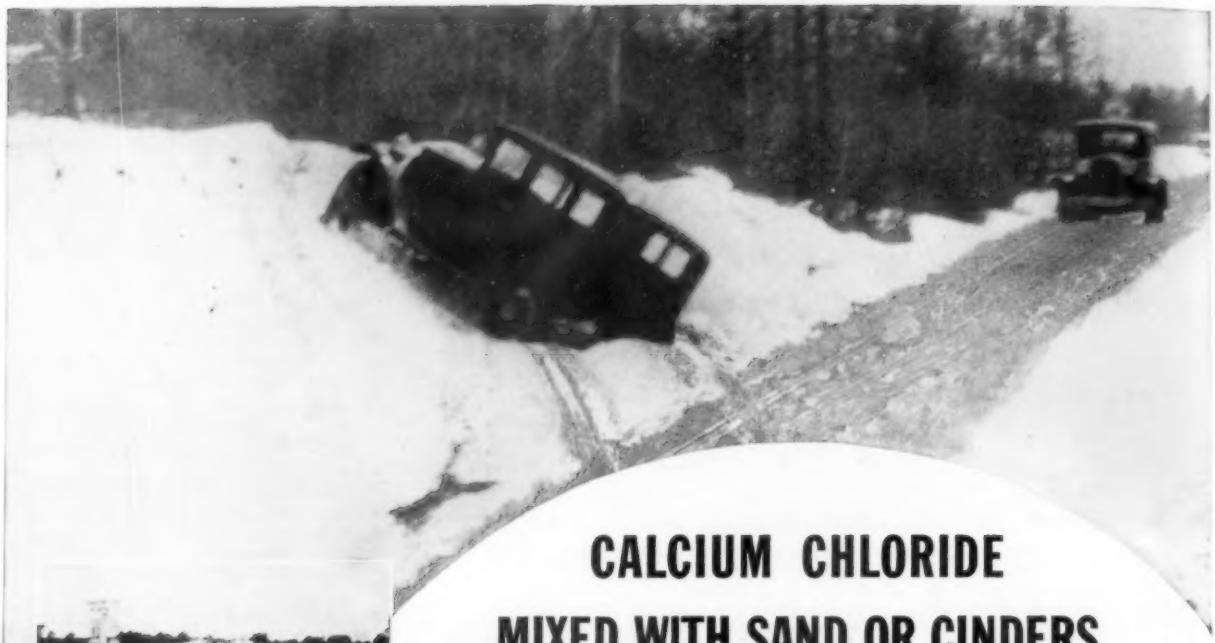
Recent City Manager Appointments

O. M. MOSIER, City Manager of Oklahoma City, has resigned, to take effect about January 1, to become Vice-President of the Braniff Airways, Inc. F. G. Baker, who has been City Auditor of Oklahoma City for 15 years, has been appointed to succeed him.

Nat C. Nave has succeeded E. C. Alexander as City Manager of Elizabethton, Tenn.

Robert T. Hargrave, former City Engineer and more recently Project Engineer for the State Road Department, has been appointed City Manager of Gainesville, Fla., to replace George H. Cairns.

CLARENCE E. RIDLEY,
Executive Director, International City Managers' Association.



Stock pile of ice control material treated with calcium chloride.

Loading cinders into truck from cinder bin.

Spreader gives thin, even distribution — saves material.

CALCIUM CHLORIDE MIXED WITH SAND OR CINDERS WILL MAKE ICY PAVEMENTS SAFE

That "all-gone" feeling when your car skids in front of oncoming traffic is a horror few people care to repeat. These little skids that lead to big accidents can be prevented by applying sand or cinders treated with calcium chloride.

With ability to melt ice even at 30° below zero, the calcium chloride covered sand particles melt them into the ice and leaves them anchored there. This treatment forms a surface like sandpaper, which gives traction to wheels, action to brakes, and safety to drivers.

This standard and most widely used method of ice control is as practical as it is simple. You just prepare stockpiles with calcium chloride, or fill storage bins ahead of time. Then you're ready for ice and sleet. The calcium chloride keeps materials from freezing, ready for instant loading, easy application, and quick effect. Many state highway departments place drums, covered boxes or bins of such treated materials at the side of the road near hills and curves, to aid drivers who cannot make the icy grades.

Specifications and data covering methods, amounts to use, and general information on this nationally accepted method of ice control may be had from any of the firms listed below. Get data now and be ready to save more lives this winter.

CALCIUM CHLORIDE ASSOCIATION

The Columbia Alkali Corporation . . Barberton, Ohio
The Dow Chemical Company . . . Midland, Michigan
Michigan Alkali Company . 60 E. 42nd St., New York City
Solvay Sales Corporation . 40 Rector St., New York City

CALCIUM CHLORIDE

FOR BETTER ICE CONTROL

Traffic Control and Facilitation

Conducted by Publications Committee, Institute of Traffic Engineers, 1 Park Ave., New York
Paul L. Green, Chairman; John Gibala, Vice-Chairman; Donald M. McNeil, Dwight M. McCracken, D. Grant Mickle, Robert A. Mitchell, Edward J. O'Meara, John C. Wrighton, Charles G. Beckenbach, Bruce D. Greenshields, Leslie J. Sorenson, Charles H. Rex, Tracy D. LeMay

Numerous Uses for Traffic Data Produce Two Mechanical Counters

Some of the Needs, and the Traficounter

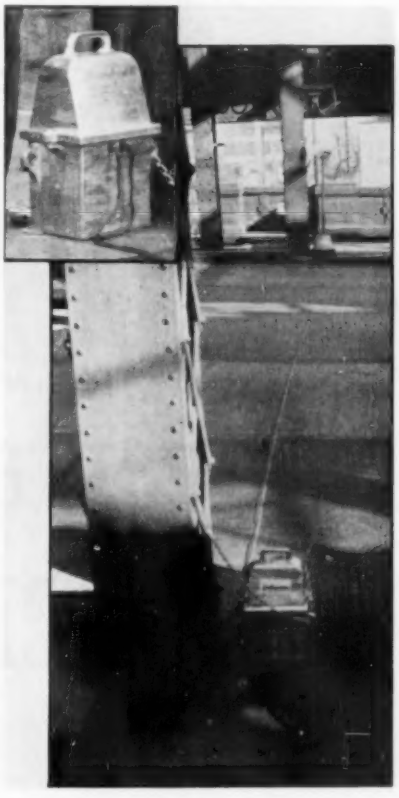
MUCH of our statistical work in traffic engineering must be based upon the fundamental characteristics of traffic behavior. One of the most important of these is the distribution of volume through time, not only hourly, but daily, weekly, monthly, and on the cyclic basis. It is rather an astounding fact that there are only a few hundred 24-hour counts available in the United States. The mechanical metering of traffic appears to be the solution, and this article describes a recent development which I consider of importance.

Today every city needs a definite measurement and analysis of its traffic for the purpose of solving not only the safety and congestion problem but its trading and marketing problems as well.

The daily movement of people and goods is of basic economic significance. The increased mobility of the individual consumer, due to the automobile, has resulted in a number of basic changes in trading areas. It has enlarged the range of individual freedom and of market choice in a way hitherto unknown. It is altering the distribution of resident population, making it unnecessary for the individual to live close to his place of business or even to fixed transportation lines. This freedom has broadened the range of each trade establishment and of market centers, making it possible for them to draw trade or patronage from far-removed buying power. This situation has a powerful effect and influence upon the whole scheme of the distribution of merchandise, including selling and advertising. It has fallen to the lot of research to determine the extent and degree of this influence, and to interpret these vital changes in the business structure to the buyer and seller of retail commodities.

Data Costly and Few

In all these studies of the relationship of traffic to safety, congestion, marketing and distribution, there is a basic need for more standardized and comprehensive traffic data of all kinds. Volume data are of course the base data. It is significant that despite all the traffic studies made in the last few years, there are very few long-time volume studies and especially few long-term counts covering weeks and months. We have little knowledge of seasonal and cyclic changes in traffic volume. The Traffic Audit Bureau, Inc., maintains approximately 1,000 monthly counting stations throughout the United States, adequate for its purposes, but entirely inadequate for the need of the entire traffic problem. The reason for this lack of long-term volume information lies in cost. A one-year continuous volume count by manual method at even one station would cost about $3,600. Mechanical metering methods are obviously indicated, as against the normal practice of counting passing traffic by stationing men at strategic counting stations.



TRAFICOUNTER SHOWN ON QUEENSBOROUGH BRIDGE, NEW YORK CITY

Traffic and highway engineers have long sought some means of gathering and recording traffic data which will show the fluctuations of traffic over various streets and highways for long periods of time. A noteworthy step toward the realization of a satisfactory traffic meter is that made by John Paver, formerly Harvard Research Fellow.

The Traficounter

The portable Traficounter, as it is called, is a simple mechanism weighing approximately 40 pounds and consisting of an inconspicuous contact strip affixed to the roadway by means of an adhesive, and an automatic traffic data accumulator recording on a printed tape. It is operated by a battery.

The Traficounter may be located and left at any point on a street or highway where it is desired to record passing traffic. Without any manual attention, it ticks off every passing vehicle.

With such a device it is now possible for the safety, highway and municipal engineer and the marketing expert to gage the stream of traffic at any point on any thoroughfare at any hour of the day or night and to apply the resulting information of their respective problems. The same information becomes of value to realtors, marketers of gasoline and oil, and to business men who are interested in the location of stores and the values of advertising display.

MILLER MCCLINTOCK,
Director, Harvard Bureau for Street Traffic Research.

Traffic Counts with Mechanical Counters

THE United States Bureau of Public Roads has entered into cooperative agreements with forty state highway departments to conduct comprehensive highway planning surveys. An important phase of this work is an extensive traffic census covering the rural highway system in each state.

In the development of the traffic census a number of sampling systems have been used, the schedule of counts for the more reliable of these systems being designed to produce averages which reflect properly the fluctuations of traffic through the hours of the day, the days of the week, and the seasons of the year. Mechanical counters are proving useful in this work.

The automatic recorder being used in this program was developed in the fall of 1935 and is now in production by the International Business Machines Corporation under a contract which permits purchases by the several state highway departments as well as the Bureau. Approximately 400 units have been purchased under this contract, and an additional number will be purchased by states in which field work is yet to begin. A number of machines have recently been delivered and installed.

Cold Springs, Minn. used Stanolind Cut-Back Asphalt on this street this Fall

Another street in Cold Springs, Minn., paved with Stanolind Cut-Back Asp

Check these Advantages of STANOLIND CUT-BACK ASPHALTS

AND SEE HOW THIS IDEAL PAVING MATERIAL FITS YOUR NEEDS!

- ✓ **Furnished in 5 grades to provide proper fluidity for different types of construction.**
- ✓ **Give a uniform, effective bond.**
- ✓ **Economical—low first cost, long life, and low maintenance costs.**
- ✓ **Simple in Application—Expensive equipment not needed.**
- ✓ **Provide non-skid, non-glaring surface, assuring the maximum in safety.**

Stanolind Cut-Back Asphalt has been used for the busiest streets in the world. It is the ideal paving material for every traffic requirement, providing *extra safety values* in a non-skid and non-glaring surface. More miles of road in the Middle West have been paved with Cut-Back in the last decade than with any other material. Take advantage of the experience of Standard representatives in selecting materials and methods. Their help is free—yours for the asking. Just phone your local Standard Oil (Indiana) office or write to

Copr. 1936, Standard Oil Co.

ASPHALT *goes farther*

STANDARD OIL COMPANY
910 S. MICHIGAN AVE. (Indiana) CHICAGO, ILL.

IN **LONG-WEARING ROAD MILES . . . *IN*** **DISTRIBUTION OF LABOR . . . *IN*** **TAXPAYER SATISFACTION**

Application to Urban Traffic

I see no reason why automatic traffic recorders are not equally applicable and worthy of consideration by engineers interested primarily in the problems of urban traffic. Recognizing the need in cities for more complicated and detailed counts involving the enumeration of turning movements, pedestrians and the like, I believe that typical patterns obtained from automatic traffic recorders located on main arteries and feeder streets would be very valuable in modifying and expanding the detailed intersection counts.

How the Machine Operates

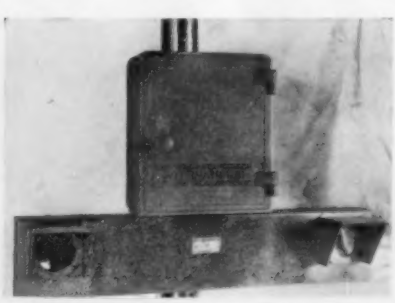
Two parallel beams of light approximately 30 inches apart directed across the roadway upon photoelectric cells must be interrupted simultaneously to operate the counting mechanism. Pedestrians, who interrupt only one beam at a time, are not counted. The light source unit and the receiving unit are installed so that the maximum distance between units does not exceed 50 feet, and they are mounted on poles at such a height that the light beams are 44 inches above the road surface and parallel to it. At this height they are intercepted by passenger cars below the windows and by trucks above the frame.

The printing mechanism stamps once each hour on the hour on standard adding-machine tape, the day of the week, the hour of the day and the cumulative traffic total. The number of vehicles passing each hour is obtained by calculating the difference between two successive readings. Post meridian time is indicated by a dash under the hour figure. If the current fails, the recorder will stamp automatically the time of the failure and the cumulative counter reading.

Assuming an average life of five years, it is estimated that the recorders can be operated for about $150 per year, including depreciation, installation cost, maintenance and electrical service.

Errors

There are two sources of error in the photoelectric type of detector which might be mentioned. The simultaneous passage of two vehicles is recorded as one, a minus error. Offsetting this, single vehicles with peculiar bodies or with large openings on the body, such as a tractor semi-trailer combination are frequently recorded twice. These errors tend to compensate each other, and check counts indicate an error in no case more than 5 per cent and usually within 1 or 2 per cent over an 8-hour period. This error is somewhat greater and more variable for shorter periods of time. The photoelectric tubes are very sensitive and can be adjusted to record vehicles passing at extremely high speeds. The machine is designed to count as many as 24,000 interruptions of the light beams per hour.



THE RECORDING AND LIGHT-RECEIVING ELEMENT

LAWRENCE S. TUTTLE,
Highway Engineer-Economist, U. S. Bureau of Public Roads.

—From an address delivered before the Institue of Traffic Engineers at Atlantic City, October 3, 1936.

When the White Stripe Is Wriggly It's Time to Eschew Speed

TO warn the motorist that he is approaching an intersection, City Engineer Ralph Dorsey of Los Angeles has substituted for the conventional painted center stripe a wavy white stripe that, according to the magazine *Time*, appears to wiggle. Further emphasis is furnished by mixing the white paint with glass beads 1/20-thousandth inch in diameter, said to be very effective at night, when 64 per cent of California crashes occur.

With the Parking Meters

THE November issue of *New Jersey Municipalities* states that since the time when traffic lights were synchronized there have been many efforts to relieve the traffic situation, "but there has been no great improvement until the quite recent advent of the parking meter." The favorable experience of metered cities is then summed up. The chronic, all-day illegal parkers remove to other streets. Gone is the necessity for cruising around looking for a convenient place to park.

At least 26 cities have put through parking meter ordinances, and half of these provide for means of collecting and using the money from the meters. In Dallas, Fort Worth and El Paso, the police perform the job. In Kansas City, it is the Public Works Department; in Seattle, the City Treasurer.

Most of the cities have collected fairly large sums from the meters: Fort Worth, $6,000 in June and $1,200 in July; St. Petersburg, Fla., $5,684 in five months, February through June; Miami, $20,342 in six months, January through June.

Parking meters are in use in the business districts of the following cities:

Oklahoma City, Okla.	Salt Lake City, Utah
Dallas, Texas	Waco, Texas
St. Petersburg, Fla.	San Antonio, Texas
El Paso, Texas	Lubbock, Texas
Miami, Fla.	Toledo, Ohio
Houston, Texas	Topeka, Kans.
Fort Worth, Texas	Cumberland, Md.
Kansas City, Mo.	Tyler, Texas
Meadville, Pa.	Long Beach, Calif.
Mobile, Ala.	Macon, Ga.
Corpus Christi, Texas	

While parking meters certainly do bring in revenue, as shown above, their first purpose is to relieve traffic congestion. It is as a service to motorists, merchants and police departments that parking meters are primarily to be considered. In order to sift out the unnecessary parkers, a charge is made. That this charge, multiplied, is gratifying is incidental to the job of successfully regulating traffic.

Figures in the Traffic Problem

WE are all so familiar with the elements of the highway accident problem that we rattle them off without perhaps visualizing just what is meant. We speak glibly of the car, the driver and the highway. When we speak of the car, we mean 27,000,000 cars and trucks. When we speak of the highway, it is 3,000,000 miles of good, bad and indifferent roads to which we refer. When we speak of the driver, it is an army of 40,000,000 men, women and boys with whom we are concerned. Before the year of 1936 winds up, more than 400,000,000,000 passenger-miles of highway travel will have been accounted for by those 27,000,000 cars and trucks, as contrasted with perhaps 30,000,000,000 passenger-miles by steam railways, our second most important transportation unit.

Enforcement has no worth-while part in accident prevention unless its primary aim is to educate rather than punish. The National Safety Council itself has sponsored this idea of enforcement for educational purposes, and such men as Kreml, Marsh, Williams, Halsey, Hammond, Reeder and others have given it great impetus in traffic officer training courses. The modern traffic officer is a gentleman and a teacher as well as a guardian of the law.

PAUL G. HOFFMAN,
Chairman, Safety Traffic Committee, Automobile Manufacturers' Association; from an address before the National Safety Congress.

Courtesy of Saturday Evening Post

CAN'T WE TALK THIS OVER, OFFICER?

SERVICISED
EXPANSION JOINTS

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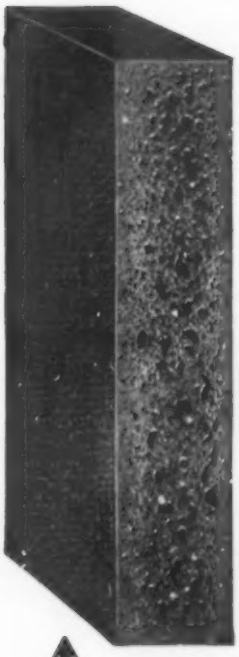
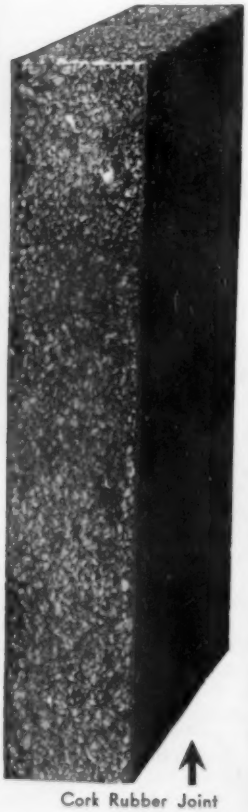


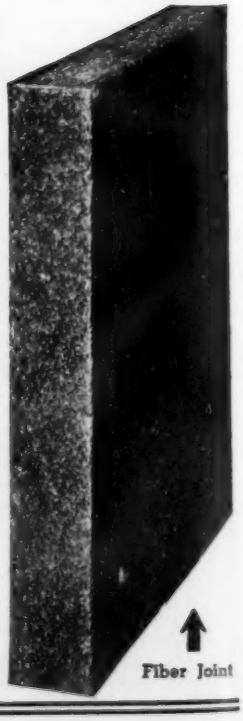
Sponge Rubber Joint

Type B Asphalt Joint



Cork Rubber Joint

Felt Sided Asphalt Joint



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Improving Municipal Administration

Current Items from the Public Administration Clearing House

Humanizing Government a Job for City Managers

MAKING a human instrument of his local government instead of merely an economical, efficient mechanism is the job of the city manager, said Hollis R. Thompson, himself Manager of Berkeley, Calif., at the recent conference of the International City Managers' Association in Richmond, Va.

A city manager can employ experts for engineering, legal, financial and public health problems, and can in other matters foster business and professional efficiency, said City Manager Thompson, but he alone is the officer "who can coordinate all of this efficiency for the greatest possible promotion of the general welfare of the whole city population." One of the chief aims of council-manager government, he pointed out, is to do the job more scientifically by applying the tests of the laboratory. But this does not mean, he added, that managers should be "dispassionate pieces of machinery"; if they are, they will not "retain the human interest of the people of the city." In addition to building parks and playgrounds, the city managers must see to it that the parks and playgrounds become centers expressing the government's interest in men, women and children all over the city.

In Mr. Thompson's opinion, "city managers are pioneers in a movement which will do more to return to the people confidence in the democratic form of government than any other movement now apparent in the governmental affairs of the nation." He said: "People have unconsciously gained a false impression through seeing countless newspaper articles and cartoons depicting unsavory conditions in the governments of cities, counties, states, and the nation. They are led to believe that bad, inefficient, even corrupt conditions in one city are typical of all governments. The confidence of the people in their own ability to govern themselves will be restored wherever city managers are reducing tax burdens, making a more scientific approach to cities' fiscal problems, and responding better to the needs of the people in terms of service."

Preparing for a "Boom"

IF the mounting curve of industrial production, improved municipal credit, the sharp rise in the marriage rate, and the large increase in home construction are true signs of a coming boom, city planners have an "advance job" laid out for themselves, according to Walter H. Blucher, Executive Director of the American Society of Planning Officials. "The present," Mr. Blucher says, "is a very good time to review some of the wasteful and inefficient municipal practices of the recent past, with a view to avoiding their repetition and substituting more effective practices for future programs of civic development."

One way in which cities can protect the private and public investment in land and buildings is to re-study and perhaps redraft the local zoning ordinance to see whether it stabilizes and protects, or rather helps to maintain high and largely fictitious speculative values. City plans should be reconsidered in the light of the need for additional lands to house new families of the increasing and shifting population. The need for additional streets, gas and water mains, new schools and adequate recreation space should be calculated in advance of the boom period —not as in the majority of cases in the past, when too much subdivided territory with expensive streets, utilities and sidewalks was provided.

Not only should the physical changes in cities be determined several years in advance, says Mr. Blucher, but a capital budget should be set up to distribute over a period of years the costs of the development program. When unemployment figures are up and interest rates down, it is a good time for municipal public works building; but some public works, such as streets, sewers, schools and hospitals, are needed in good times or bad, and should be provided for.

The city plan commission is the logical agency to determine future city needs in the way of areas for home building, sensibly related to employment centers, with streets and transit facilities for people to move easily back and forth to work, to school, to the grocery store, to the city hall, to the movies, to the city's parks, and out to the suburbs and the open countryside. And to determine how all these municipal services can be supplied on a high plane of administrative, technical and social efficiency, at as low a cost to the taxpayer as possible.

Wichita's Use of the Lie Detector

POLICE departments in a number of American cities use the polygraph, nicknamed "lie detector," for special criminal suspects when other techniques have failed to extract confession. But Wichita, Kans., reports the *Police Chiefs' News Letter*, official bulletin of the International Association of Chiefs of Police, operates its polygraph continuously during each working day, and has done so for the past three years. Suspects in all types of crime from murder to petit larceny are examined by an operator, whose only duty is to determine the guilt or innocence of those brought to him by police detectives, and to examine vagrants who are picked up and held overnight.

Over the three-year period the Wichita Police Department has obtained approximately 20 confessions a month that would not have been secured without the use of the lie detector, Police Chief O. W. Wilson reports. Statistics show that approximately 60 per cent of those caught lying by the polygraph actually confess their guilt.

As an example of the efficiency of the lie detector, Chief Wilson quotes an incident of 1935, when a series of taxicab hold-ups was reported to the police. In less than two months, the crime had been reported by twelve different taxi-drivers. When the drivers were examined with the lie-detector, nine of them confessed that their reports had been false before the investigation was finished. They had made the false reports to evade paying the cab company their usual fees. One of the other three drivers refused to admit his report false, but the polygraph records indicated that he was lying. The remaining two cases were actual hold-ups, and the bandit was later caught.

"Floaters" or transient vagrants are examined on the polygraph to determine whether they are guilty of an offense for which they might be wanted by police. The results of the examinations, reports Chief Wilson, have solved crimes that were committed hundreds of miles distant and have returned escaped convicts to their respective institutions.

Cincinnati Checks Police Beats

CINCINNATI'S Department of Public Safety believes that a policeman covering a limited beat on foot is a most effective means not only of preventing crime in the troublesome districts of a city, but of dealing with a number of other social situations. To determine the proper, minimum number of foot patrolmen for the city's own troublesome "basin area," the Department has sponsored a survey showing the amount of work a patrolman can perform efficiently in an eight-hour shift in such a neighborhood. A report on the survey has just been published by the American Public Welfare Association to serve as a guide to other cities wishing to make similar studies.

Demands of present-day metropolitan life, the survey explains, require that a patrolman "be much more than the threat of a uniform, a badge and a nightstick." He should be, to a certain extent, a social worker familiar with his cases and their problems. And he should have time to study those problems and, to the extent of his authority, work out the solutions that will prevent delinquent individuals from beginning or continuing careers of crime.

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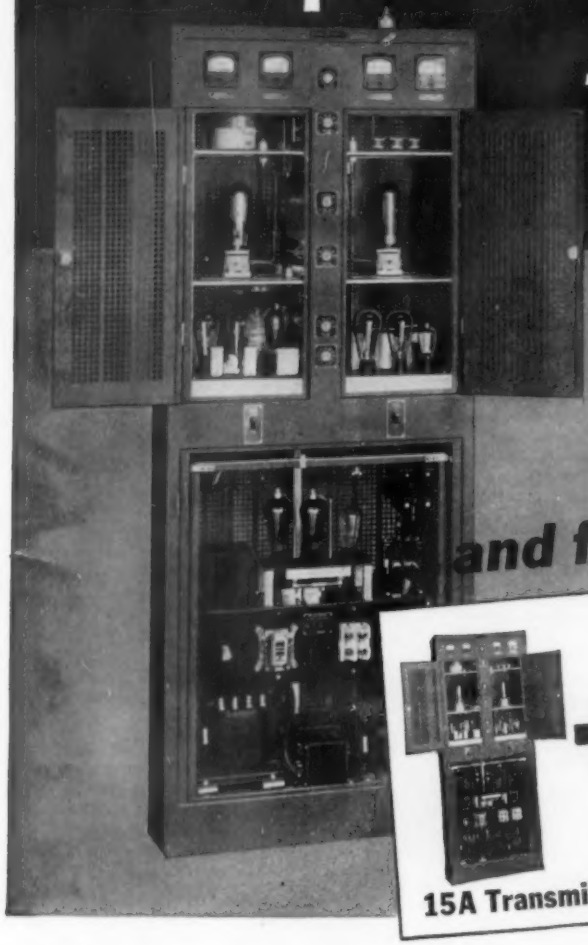

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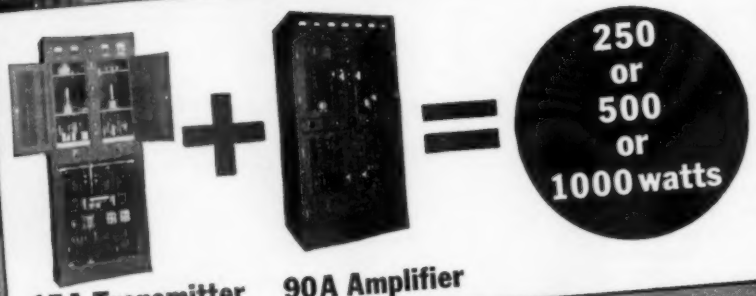

Your police will work faster, more effectively with this Western Electric radio transmitter on the force. It delivers 100 watts carrier power on frequencies between 1500 and 3000 kilocycles—is completely A C operated—low in operating cost—high in quality of voice transmission.

And note this point—it's important. Because of its design, this 15A transmitter enables you to step-up your power and coverage later on with the greatest ease and the least expense. You need not change your transmitting equipment—simply add the Western Electric 90A Amplifier which gives you 250, 500 or 1000 Watts.

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POLICE RADIO TELEPHONE EQUIPMENT

Cincinnati's basin area, 4 square miles in size, is an insignificant part of the 73 square miles of the whole city, but it demands considerably more than half the total time spent in policing the entire metropolis. Mixture of races, poverty, and poor living conditions in the area contribute to the crime rates in this area, which shows homicide figures for Cincinnati as a whole 124 per cent above the national average, figures for aggravated assault 85 per cent, and figures for larceny and theft 20 per cent higher than the average for the country.

The chief reason for the high criminal average of the "basin," according to the survey, is that criminals know they have better than a 50-50 chance of escaping after committing a crime because of the inadequacy of police protection. In 1934, for example, only about 3,700 of approximately 8,000 major offenses known to the police were cleared by arrest. "Because of the relatively small personnel," says the survey, "the Police Department can attain its maximum efficiency only by concentrating on the solution of major crimes. To divide its limited resources between both detection and prevention of crime would result in two jobs poorly done."

The survey criticizes the present beats as being for the most part too large to permit efficient patrolling, and indicates that social conditions in the various police districts have so changed since the beats and districts were laid out many years ago that there is no uniformity in the activity required to police them.

The survey works out what it considers properly-sized police beats for the basin area, so that each one will take no more than 460 minutes to patrol thoroughly. This would necessitate an addition of 111 men to the Department for foot patrol. A re-districting of police divisions is also recommended, so that uniform social conditions prevail in each district, which will give patrolmen a chance to "specialize" against its characteristic crimes. The survey also recommends that patrolmen covering beats be relieved of all traffic duties except those of an emergency nature, and that a sufficient number of police sergeants be freed from station-house clerical duties or added to the existing corps of officers so that a thorough system of inspection of foot-beat patrolling methods may be maintained constantly.

Lip Service or Civil Service?

THE American people have paid lip service to civil service for years, but "there has been widespread evasion of civil service procedures and in many jurisdictions a wholesale corruption of the merit system," according to Clarence A. Dykstra, City Manager of Cincinnati. In a pamphlet just issued by the Civil Service Assembly of the United States and Canada, Mr. Dykstra suggests reconsideration of the orthodox idea of the civil service.

According to the orthodox notion of civil service, he says: "We have wished to prevent the giving of public jobs for party work or because of family connection; we have tried to maintain the integrity of the service by certain ideas of tenure and employee security; and we have further put into effect standardized salaries and classification systems, plus retirement allowances of some kind in many places." In one sense, he points out, "this has been a negative program conceived in some large degree (1) as a protection against patronage and (2) as a guarantee to employees. For this latter reason . . . many conscientious and able executives have opposed what we have called our 'civil service system.' They insist that it has been so rigid and inflexible that they cannot operate effectively—that they cannot get rid of the incompetents."

There are other forms of favoritism besides political patronage and nepotism that should be eradicated from the public service, says Mr. Dykstra. These include restriction of jobs to local residents; and veterans' preference laws, which limit large areas of the public service in many jurisdictions almost entirely to veteran groups, and in 1934 resulted in 25 per cent of all appointments going to veterans.

A modern idea of civil service, according to Mr. Dykstra, is bound to recognize that government faces "exactly the same question that confronts all industry and business—what kind of organization and what personnel can carry on most effectively in the conduct of the enterprise?" Proper management of the modern civil service will include not only testing and classification methods by which capable people can be found to perform the hundreds of technical and other tasks required of government, but also the provision of fair compensation, good working conditions, opportunities for promotion and advancement, and retirement allowances—in fact, establishing of a career service in the public business which will attract and keep some of the best talent that the nation produces.

Traffic Accident Investigation Becomes Police Specialty

STEEL tape measures, cameras and decelerometers are familiar tools in the hands of policemen of nine cities in the country when they arrive at the scene of an automobile accident. These are the cities that have established traffic accident prevention bureaus, to make scientific check of the causes for road smash-ups, with the idea of determining who or what is to blame.

Installations of the accident prevention bureaus are made with the aid of the International Association of Chiefs of Police, through its Safety Division, which has been functioning since June of this year. Hartford and Waterbury, Conn., have most recently been added to the list of cities with this new safety measure, according to the *Police Chiefs' News Letter*, official bulletin of the Association. Waterbury is being made a "case study" in the preparation of a textbook which the Association is to use in the training program conducted along with the installation of the bureaus.

Syracuse, N. Y., and Louisville, Ky., have had the longest experience with accident investigation bureaus. Theirs were the first to be organized, under direction of Lieut. Frank M. Kreml, Evanston police officer who now heads the Safety Division of the International Association of Chiefs of Police. Louisville found a 15 per cent reduction in accidents during the first six months of its bureau's existence.

Two other Connecticut cities—Bridgeport and New Haven—have had accident prevention bureaus installed. Others have been established in South Bend, Ind., Cincinnati, Ohio, and Saginaw, Mich. Miami's bureau is now in process of installation, and Columbus, Ohio, and Atlanta, Ga., are next on the list. The Michigan State Police will also be aided in training a squad of specialists in traffic accident prevention knowledge.

The Municipal Bond Market

Recent sales of new issues from the November numbers of *The Bond Buyer*:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$250,000	Harrisburg, Pa., Improvement	1	1.5 Ser.	.98
1,000,000	Rhode Island, Fourth Unemployment Relief	1	6.33 Avg.	1
150,000	Schuylkill Co., Pa., Court-House Improvement	1.5	5 Avg.	1.37
100,000	Springfield, Mass., Whitman Street Bridge	1.75	10.33 Avg.	1.67
100,000	Sedgwick Co., Kans., Relief	2	1-10 Ser.	1.70
100,000	Nashua, N. H., Permanent Public Improvement	2.5	1-20 Ser.	1.99
1,500,000	Rhode Island, Public Works Loan of 1935	3	16-25 Ser.	2.12
124,000	Clayton, Mo., School	2.25	12.16 Avg.	2.17
107,000	Somerville, N. J., Refunding	2	6.5 Avg.	2.34
1,332,000	San Francisco, Calif., Water Distribution	4	9.66 Avg.	2.51
138,000	Brunswick, Maine, School	3	13 Avg.	2.55
144,000	Wilson Co., Tenn., School	2.75	15.25 Avg.	2.75
200,000	Rahway, N. J., Sewer	2.90	10 Avg.	2.89
150,000	Meagher Co., Mont., Refunding	3	4.66-10.66 O.-A.	3
135,000	Henry Co., Ill., School	3.5	10-19 Ser.	3.44
126,000	Hickory, N. C., Sewerage Improvement	4	13.16 Avg.	3.49
436,000	St. Francis Levee Dist., Ark., Levee	4	20.75 Avg.	4.10
413,620	New Orleans, La., Refunding Paving Certificates	4.5	14.16 Avg.	4.35
155,000	Greenville Co., S. C., Augusta Road, Water and Sewer Sub-Dist.	4	15 Avg.	4.49
150,000	Jackson Parish, La., Court-House	5	11.85 Avg.	4.91

During one week of bitter cold and very heavy snow, Commissioner Frank Schumacher of Sandwich, Ill., kept his highways clear, working day and night, and as a result:

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Prepared by
FRANK B. WILLIAMS
Author of "The Law of
City Planning and Zoning"

Zoning and Planning Notes

From Data collected
by the Zoning Committee
of New York
(233 Broadway)

Aviation—Right of Landowner in Air Space Above His Land

CALIFORNIA.—*Hinman v. Pacific Air Transport; Same v. United Air Lines Transport Corporation*, 84 Fed. 2d, 755 (Circuit Court of Appeals, Ninth Circuit, July 20, 1936).—The appellants are owners of land in the city of Burbank, Calif., and claim to own a stratum of air space over it, extending upwards to such an altitude as they may reasonably expect now or hereafter to use or occupy, being not less than 150 feet above the surface. The value of this space they claim to be more than $300,000.

The defendant air transport companies, engaged in operating a commercial air line, have repeatedly traversed this air space at altitudes less than 100 feet above the surface. In so doing, they have followed two courses which by constant uses have become well-defined. The appellants therefore allege that there is danger that defendants by this use will obtain a servitude or easement giving them the legal right so to do, and therefore ask for an injunction against such uses. The appellants also claim damages of $1,500 a month, as rental for the use of this air space.

It has been said that a landowner owns from the center of the earth to the sky. The court rejects any such theory; the statement simply means that the owner of land could use the overlying space to such an extent as he was able, and that no one could ever interfere with that use.

The appellants' case, then rests upon the assumption that as owners of the soil they have an absolute and present title to all the space above the earth's surface, owned by them, to such a height as is, or may become, useful to the enjoyment of their land. This claim the Court believes, and finds to be sound. The very essence and origin of the legal right of property is dominion over it. Property must have been reclaimed from the general mass of the earth, and it must be capable by its nature of exclusive possession. Without possession no right in it can be claimed.

The air, like the sea, is by nature incapable of private ownership, except so far as one may actually use it. We own so much of the space above the ground as we can occupy or make use of. This right is not fixed. It varies with our varying needs, and is coextensive with them. The owner of land owns as much of the space above it as he uses, but only so long as he uses it.

When it is said that man owns, or may own, to the heavens, that merely means that no one can acquire a right to the space above him that will limit him in whatever use he can make of it, as a part of his enjoyment of the land. Any use of such air space by others which is injurious to his land, or which constitutes an actual interference with his possession or his beneficial use thereof, would be a trespass for which he would have remedy. But any claim of the landowner beyond this cannot find a precedent in law nor support in reason.

But it is utterly impracticable for the landowner to attempt to stake out, or assert, claims to definite, unused spaces in the air in order to protect some contemplated future use of it.

It is stated that appellee's airplanes glide through the air within a distance of less than 100 feet of the surface of appellants' land, or possibly within 5 feet of it. This proximity may constitute an impairment of the landowner's full enjoyment of his land. If so, it would entitle him to some form of relief. But no facts showing that such proximity is causing such impairment are stated by appellants, and they therefore are not entitled to an injunction against such proximity. This case differs from a trespass on land, where plaintiff is entitled to at least nominal damages without proving actual damage; for traversing the air is a lawful act unless done under circumstances which will cause injury to plaintiff's possession, and the Court holds that an injunction cannot be obtained by reason of the likelihood that defendant will obtain the right to traverse the air space over plaintiff's land, because no such prescriptive right to traverse such space can, by the law of this country, at least, be obtained.

EDITOR'S NOTE.—See in this connection the Georgia case of *Thasher v. City of Atlanta*, with note referring to other decisions, in these Notes for June, 1934.

Water Rights

GEORGIA.—*Robertson v. Arnold*, 186, S. E. 806 (Supreme Court, July 2, 1936). There is an old maxim in the law—"Water runs and it ought to run in the same way in which it was accustomed to run." A riparian landowner is entitled to have it run in this way, regardless of whether the use to which he may wish to put the water is present or only prospective. Therefore damages to which the landowner may under any probability be subjected in future are not "speculative," but an injunction may at once be granted for protection against such damage.

Zoning Ordinance — Residential District—Boarding House Estoppel

NEW YORK.—*Cassidy v. City of Long Beach*, reported in *New York Law Journal*, June 24, 1936, p. 3226 (Supreme Court).—The zoning ordinance of the city does not expressly prohibit boarding houses in a "Residence" district; and it is doubtful whether the phrase "a one-family detached house for one housekeeping unit only" can be given this effect.

A very persuasive case of estoppel is made out against the city by showing that it has regularly levied and collected increased water rates upon the properties in question owing to the very fact that they were being operated as boarding houses.

Highways—Tolls

NEW YORK.—*Town of Oyster Bay v. Moses*, 287, N. Y. S. 826 (Supreme Court, May 8, 1936).—In this action the town of Oyster Bay is seeking to prevent the collection of tolls for passage over Wantagh Causeway, which connects the mainland of Long Island with Jones Beach, and the Court denies the right of the town to do so, affirming the legality of the tolls. The Legislature has the power to close roads once free of passage and exact tolls for a purpose authorized. It is said that the doctrine prevails in England that the proceeds of the toll must be expended solely for the purpose of maintaining the highway. This conclusion is not justified by the English cases cited; and in any event no such doctrine seems to prevail in this country.

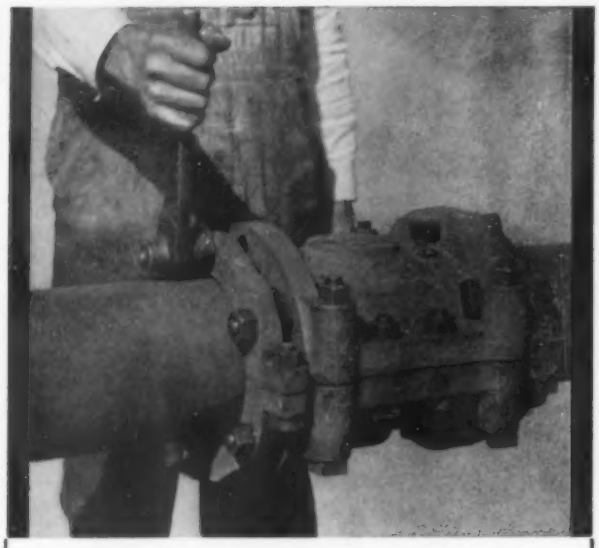
The development of Jones Beach as a park and the connecting roads constitute a single enterprise and the tolls collected are not for profit but solely for maintaining the park and parkways and for paying the debt incurred in their development.

EDITOR'S NOTE.—In these days of increasing demands for recreational facilities and increased difficulty in obtaining the money for them, this decision will be helpful. It is not uncommon nowadays for park authorities to obtain revenue for the upkeep of parking systems by charging for concessions such as refreshment stands and bathing privileges, or by running these facilities themselves, and there would seem to be no reason why roadways for access to parks should not be treated in the same way.

Zoning Ordinance — Temporary Permit—Undeveloped Neighborhood—Res Adjudicator

NEW YORK.—*Matter of William Berea Cont. Co., Inc. (Murdock)*, reported in *New York Law Journal*, May 14, 1936, p. 2475 (Supreme Court, Bronx County).—The Board of Standards and Appeals had granted a temporary permit to erect a gasoline station, the period had expired, and the Board granted another temporary permit. This is an action to sustain the determination of the Board granting this new permit.

If this matter rested alone upon the discretion of the Board, their action



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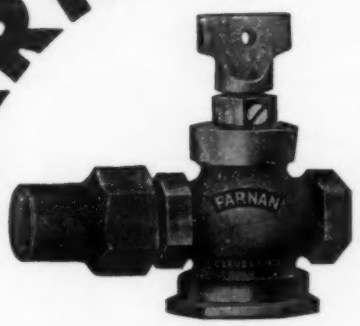

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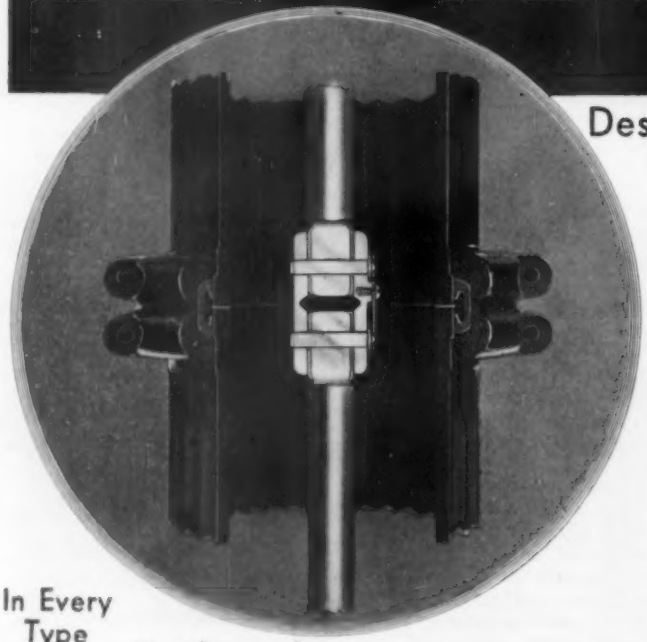

THE sections of the **PROTECTOP STANDPIPE** are joined by a frangible clamp which encloses a rubber gasket designed to eliminate all possibility of leakage. The hydrant stem is made in three sections, the central section being of cast iron amply strong to resist the strain of opening and closing but having a frangible point in line with the frangible point of the clamp.

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should certainly be sustained. The Board, however, did not exercise its discretion, but adopted a method in reaching its determination which constitutes clear legal error. Instead of determining the facts presented to it, the Board determined not that the section was developed or undeveloped, but merely found that the section had not changed since the granting of the former temporary permit. The Board took the position that the previous decision fixed for all time the undeveloped character of this section, and that all it could or need do now was to determine if there was any change. The doctrine of *res adjudicata* does not apply. The subject matter is different. Another permit for another period of time was before the Board. That must be determined upon the facts as they exist at this time. That has not been done. The matter must be further considered by the Board, and an opportunity offered for further proof, if necessary, as to the character of the sections of the city involved. The motion to approve is therefore denied, and the matter is remanded to the Board.

Board of Adjustment—Filling Stations—Res Adjudicata

NORTH CAROLINA. — Application of *Broughton Estate*, 185 S. E. 434 (Supreme Court, April 29, 1936).—In April, 1932, an application was made to the board of adjustment to vary the strict letter of the zoning ordinance, and issue a permit for the erection of a filling station on the lot in question. This application was at that time denied. In April, 1935, a permit was issued for the erection of such a station on the lot in question. Objection was made, and the matter appealed to the board of adjustment on the ground that such a permit, in variation of the zoning ordinance, was denied in 1932. This protest was overruled and the issuance of the permit sustained on the ground that the traffic conditions have materially changed since 1932; and this action of the board of adjustment is sustained by this Court.

Edward M. Bassett's New Book on Zoning

This book on "The Laws, Administration and Court Decisions [with regard to zoning in this country] During the First Twenty Years" is, for the official, the lawyer and the layman alike, the best book on this subject, and will long remain so.

Human beings have but one father; intellectual and social movements have many. Mr. Bassett may therefore be described as preeminently the father of zoning in this country, and ever since its birth, in all parts of the United States, has given it his faithful and loving care. Zoning here started in New York, and he was a leader in the movement. As counsel and chief administrator of the Zoning Committee of New York, he shared the trials of zoning officials and lawyers all over the country, and gave them invaluable advice and assistance. Out of this unique experience he writes this practical book.

Mr. Bassett's book is short, and at the same time a remarkably complete presentation of advice, legal opinions and citations in the field of urban zoning. No small part of the usefulness of this book is due to the excellent index, prepared personally by the author. Here you will find no intricate and confusing analysis of the contents of the work, based upon its supposed philosophy, but a list of key words that come to the mind of the ordinary man in search of information.

—See page 101 of this issue.

A Successful Municipal Flower Show

SCHENECTADY, N. Y.—A two-day flower show, sponsored by the city, was held in Central Park, Schenectady, on Saturday and Sunday, September 19 and 20. The affair was planned by Julius W. Eger, who has been City Gardener for the past nine years, assisted by Walter S. Wood, Commissioner of Public Works, and Raymond Bradshaw, foreman of the park. Mr. Eger had never heard of a municipal flower show and was without precedent to guide him. It proved to be a success beyond all expectations and attracted thousands of flower lovers. So much interest was expressed by visitors from other localities that it is probable other shows will be conducted along the same lines next season.

Not only did the display include flowers grown in the park, but garden clubs and schools were invited to send exhibits, and the response was surprisingly large.

The site, near the main entrance to the park, was admirably adapted for the purpose, with a planted hillside rising from the lawns, and the park lake with its illuminated fountain in the background. The season was later than usual on account of dry weather, and many roses were still in bloom. The zinnias, dahlias and coxscomb made a gorgeous display, and many unusual varieties of flowering plants were shown. The illumination at night was a feature, with strings of small colored lights everywhere in evidence, and floodlights on the hill back of the show area to further beautify the scene.

The plant which created the most interest was the new pink azaleamum, which has as yet appeared in few gardens. Last year Mr. Eger was given a single plant which had been used in the rock garden at the Floricultural Society's exhibition. From this he has raised more than fifty choice plants. They were set out in a border of pink and white petunias. He is now experimenting with a later variety in a different shade of pink and also one in amber color. The azaleamum somewhat resembles the smaller garden chrysanthemums.

There was also a display of the purplish-pink spider flowers, planted with the new blue salvia, which offered a pleasing color combination. "Adirondack" chairs were placed about the grounds so that the charmed visitors could study the exhibit at their ease. Tables were provided for the cut flowers. The garden study department of the Woman's Club devised a number of effective arrangements and the school children made a creditable showing with miniature rock gardens.

The Heritage of a Town Well Named

THERE is a certain accidental affinity and magic in the name of a place. It may be an influence that gives and leaves an impression. It may be a kind of face whereby the community is known. A town, like a person with an unfortunate or bad name, may be already half-condemned and half-hanged because of the name it bears. A good name, however, may become a priceless heritage to any community.

In the Middle West there happens to be a pair of adjoining cities that are more happily named than people realize —more happily designated in some respects than any other community in America. I have reference to the twin towns of Champaign-Urbana.

To appreciate the significance of this title one must be familiar with the beginnings of the garden city movement in England—a movement that had its roots in the crowded conditions of London as well as in a little book, "Garden Cities of Tomorrow," published in 1902, which deplored the crowded city conditions and offered constructive means of improving them. Those constructive means were quite literally followed and realized in the form of a new English town known as Letchworth. In putting forth his garden city idea, Sir Ebenezer Howard included in his book a description of the advantages and disadvantages of town and country and then portrayed the ideal magnet that would combine the advantages of both city and country and called that combination the "town-country."

The State University towns of Champaign-Urbana, Ill., will be seen to offer this very combination in name. Champaign on the one hand suggests the open country, the undulating plain of the "campagna" as associated with Rome, and also suggests derivation from the word "campus" or field. On the other hand, the word Urbana obviously pertains to the city. And so we have Champaign-Urbana, the *"country-city"* dream come true in name at least, and this 140 miles south of Chicago, the city in which Sir Ebenezer Howard as a young man once served as a printer.

KARL B. LOHMANN,
Professor of Landscape Architecture,
University of Illinois.

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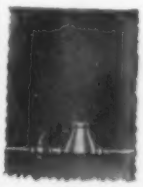

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The City's Legal Rights and Duties

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Complaint held to state valid damage claim against city for negligent maintenance of swimming pool in which youth drowned (South Dakota Supreme Court: *Glirbas v. City of Sioux Falls*, 264 N. W. 196).

City held not liable for injuries resulting when automobile swerved into unlighted steam roller parked on side of street (Massachusetts Supreme Judicial Court: *Mulvaney v. City of Worcester*, 199 N. E. 405).

City held liable for injury to child on defective sliding board in park (Springfield, Mo., Court of Appeals: *Gwartney v. City of Springfield*, 93 S. W. 2d, 62).

Contracts

Bidder on sewer job held released through elimination of part of work, but bids cannot be withdrawn after being opened and bidder cannot complain that bond instead of cash or check was required to be deposited nor because bond furnished exceeded statutory amount (United States Circuit Court of Appeals, Fourth Circuit: *Northeastern Construction Co. v. City of Winston-Salem*, 83 Fed. 2d, 57).

Drainage

City held liable to landowner for overflow caused by insufficient ditches (Kentucky Court of Appeals: *City of Covington v. McKinney*, 92 S. W. 2d, 1).

Food Regulations

Ordinance regulating food sales held invalid so far as giving officials power arbitrarily to revoke license, but not invalid for exempting community market (Michigan Supreme Court: *Ritter v. City of Pontiac*, 267 N. W. 641).

Hospitals

Ordinance for election on constructing and *maintaining* a hospital held not to authorize vote on constructing and *equipping* a hospital (Arkansas Supreme Court: *Neal v. City of Morrilton*, 92 S. W. 2d, 208).

Municipal Utilities

Light company held not entitled to enjoin operation of completed municipal plant, company having no franchise, having unduly delayed suit, and not showing prejudice through increased taxes (United States District Court, Western District of Missouri: *Missouri Utilities Co. v. City of California*, 14 Fed. Supp. 613).

Official Misconduct

City held not liable for any wrongful acts of mayor and policeman in arresting and prosecuting plaintiff (Georgia Court of Appeals: *Brown v. City of Union Point*, 183 S. E. 78).

Public Utilities

Under statute, city held bound to pay for light service for municipal building although light company agreed to furnish service in consideration for permission to place poles and wires in streets (Pennsylvania Court of Common Pleas, Northampton County: *City of Easton v. Metropolitan Edison Co.*, 27 Penna. Mun. Law Rep. 226).

Telephone company's easement in streets, etc., held taxable by city (United States Circuit Court of Appeals, Fifth Circuit: *City of Ft. Worth v. Southwestern Bell Telephone Co.*, 80 Fed. 2d, 972). See, also, *City of Ft. Worth v. Western Union Telegraph Co.*, 80 Fed. 2d, 977, decided by same court.

Water company held not entitled to enjoin rate schedule established by Public Service Commission (United States District Court, Southern District of Indiana: *Indianapolis Water Co. v. McCart*, 13 Fed. Supp. 110).

Purchases

Fire truck purchase, for which notes were given, held proper without competitive bidding or referendum (Alabama Supreme Court: *Town of Linden v. American-La France & Foamite Industries*, 167 So. 548).

Recall Proceedings

Official to be recalled held not necessary party to mandamus proceeding to require clerk to certify petitions to initiate recall election (California District Court of Appeal: *Tilden v. Blood*, 58 Pac. 2d, 381).

Salaries

City employee accepting less than wage payable under law held not barred from recovering excess on termination of employment (Arizona Supreme Court: *City of Glendale v. Coquat*, 52 Pac. 2d, 1178).

Sewers

City held liable for disposing of sewage in stream in such way as to injure lower riparian owner, despite statutory authority to maintain sewer (New York Supreme Court, Appellate Division: *Squaw Island Freight Terminal Co. v. City of Buffalo*, 284 N. Y. Supp. 598).

City held liable to landowner for seepage into well, noxious odors, etc., caused by open sewer (Illinois Appellate Court: *Harrison v. City of Effingham*, 2 N. E. 2d, 580).

Sidewalks

Statute authorizing street improvements held to cover sidewalks (Georgia Supreme Court: *Hancock v. Rush*, 183 S. E. 554).

Special Assessments

Corner lots held assessable for improvement of both abutting streets (Kentucky Court of Appeals: *City of Louisville v. Colby*, 90 S. W. 2d, 1036).

Sunday Laws

Statute forbidding Sunday afternoon baseball and football games held not void because subject to suspension in municipalities voting to suspend same (Pennsylvania Supreme Court: *Young v. Fetterolf*, 182 Atl. 676).

Taxation

Constitutional exemption of municipal property from taxation held not to cover excise tax on gasoline bought and used by municipality (Oklahoma Supreme Court: *City of Ardmore v. Oklahoma Tax Commission*, 58 Pac. 2d, 584).

City sales tax held unauthorized by charter (West Virginia Supreme Court of Appeals: *S. S. Kresge Co. v. City of Bluefield*, 183 S. E. 601).

Taxicabs

City held empowered to require taxicab operators, etc., to secure liability insurance or bond (North Carolina Supreme Court: *Watkins v. Isley*, 183 S. E. 365).

Ordinance delegating to city commission power to license taxicabs under standards promoting public safety and convenience upheld (North Dakota Supreme Court: *Ex parte Bryan*, 264 N. W. 539).

Ordinance providing for public hack stands held not to authorize agreement giving exclusive stand on street (New York City Court, New York County: *City of New York v. Yellow Taxi Corp.*, 284 N. Y. Supp. 544).

Traffic Regulations

Power to designate boulevard stop intersections held properly delegated to board of police commissioners (California District Court of Appeal, Second District: *Gould v. Western Dairy Products, Inc.*, 55 Pac. 2d, 274).

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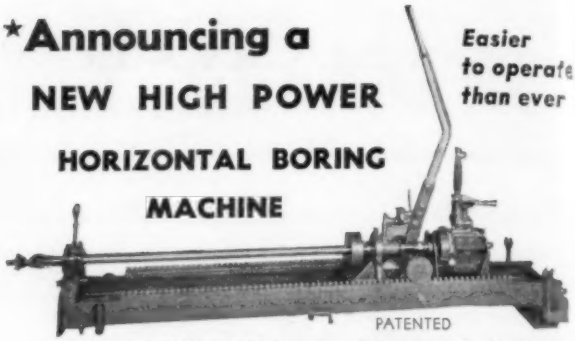

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Municipal and Civic Publications

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Zoning

Zoning, The Laws, Administration, and Court Decisions During the First Twenty Years.—By Edward M. Bassett, Member of the New York Bar. Published by Russell Sage Foundation, New York. 1936. 275 *pp.* $3.00 *from* THE AMERICAN CITY.

This volume outlines the early development of zoning in this country and records 20 years of court decisions on zoning. The first few chapters deal with zoning amendments, enabling acts, and ordinances. Chapters IV and V define the various zoning districts and cite the problem of nonconforming buildings and uses. Succeeding chapters deal with boards of appeals and court procedure. The final chapter presents an outline of particular buildings and their uses. (See page 97 for a review of this book, by Frank B. Williams.)

Planning

Planning for City, State, Region and Nation, 1936.—*American Society of Planning Officials, 850 East 58th St., Chicago, Ill. viii* + 170 *pp.* $2.00.

The Joint Conference on Planning, taking place on May 4, 5 and 6, 1936, in Richmond, Va., was entered into by the three organizations which resulted from the reorganization, a year or so ago, of the planning movement, namely: the American City Planning Institute, the American Society of Planning Officials, and the American Planning and Civic Association, representing respectively, in a general way, the professional group, the group which is officially connected with the making or administration of plans, and the group which is engaged in promoting the movement and creating popular support for it.

In this publication are reproduced the various papers presented at the conference by well-known figures in the planning field. Beginning with due attention to city and local planning, discussion finally spread out to a consideration of county, state, regional and national planning. In addition, several addresses delivered at the banquet dealt with a permanent National Resources Board, state planning and citizen support for planning.

American Planning and Civic Annual, 1936.—*Edited by Harlean James. American Planning and Civic Association, 901 Union Trust Building, Washington, D. C. xxii* + 248 + *viii* + 170 *pp.* $3.00.

Part I of this volume is entitled "National and State Planning and Parks." It is composed of selected papers, including those presented at the Conference of the National Park Service, held in Washington, D. C., January 22-24, 1936; at State Park Regional Conferences, held in Minnesota, September 26-28, 1935, and Anniston, Ala., April 2-4, 1936; and at the National Conference on State Parks at Hartford, Conn., June 1-3, 1936.

Part I opens with a review of the National Resources Committee by Frederic A. Delano. Following this is a large section on National Parks, covering standards and policies and some of the highlights in National Park legislation. A third section concentrates on our Federal City, describing the Regional Park System of Washington. In this section John Ihlder has a paper on the accomplishments of the Alley Dwelling Authority. Discussion then turns to state activities, opening with two general papers on state planning. The American Planning and Civic Association is very much interested in roadside improvement, and the Annual contains a number of reports on this subject. The final section of Part I covers quite thoroughly the latest thought on state parks.

Part II of the *American Planning and Civic Annual* presents the identical material on the Richmond Conference reviewed above in *Planning for City, State, Region and Nation,* 1936, published in a separate volume by the American Society of Planning Officials.

Municipal Bonds

Municipal Bonds, A Century of Experience.—By A. M. Hillhouse, J.D., Director of Research, Municipal Finance Officers' Association. Published by Prentice-Hall, Inc., New York, 1936. *xiv* + 579 *pp.* $5.00 *from* THE AMERICAN CITY.

A record of 100 years of municipal bond and debt administration shows that it has been following practically the same pattern of ups and downs over the entire period. In all depressions there is a heavy burden of municipal debt, this time to the amount of $16,000,000,000. This book catalogs suggestions for cities on how to prevent the recurrence of overburdening debt, and how to guard against near-insolvency. Among the most important suggestions are: a divorce between municipal credit and real-estate speculations; the maintenance of a proper ratio between fixed debt charges, current operating expenses, and revenues; elimination of short-term borrowing, and better control of expenditures through the municipal budget; the adoption of a long-range debt policy which would include use of the "tax-and-borrow" plan, whereby capital outlay for municipal improvements would be paid from borrowed funds only when they were above a predetermined normal level; and the establishment of a state-local "receivership" board to rehabilitate the finances of defaulting units.

Liquor Control

After Repeal.—By Leonard V. Harrison and Elizabeth Laine, with a Foreword by Luther Gulick, Director, Institute of Public Administration. Harper & Brothers, New York. 1936. *xx* + 296 *pp.* $2.50 *from* THE AMERICAN CITY.

"The saloon shall not return" was the widely endorsed policy at the time of the repeal of the Eighteenth Amendment. Yet the unwillingness of legislators, administrators, enforcement agencies, and also a large part of the public, especially in the cities, to accept the administrative controls and restriction that are known to be necessary to banish the saloon, has brought it back in some states. Since the repeal of prohibition in this country, we have seen the general policy of control take a most amazing number of forms throughout our 48 states. This volume is a careful study of this record of state liquor control since 1933. It is an honest, common-sense description and appraisal of the purposes and methods employed, and every type of interest in the problem should find it full of practical, pertinent information. Drys, moderates, and wets in both official and unofficial positions will find not only what is being done, but what can and what cannot be done under American conditions.

Housing

Pennsylvania State College was the first institution of its kind to sponsor a conference which concentrated on the provision of economical housing for those of limited income. The conference was held April 16 and 17, 1936, under the direction of the Department of Architecture of the School of Engineering, and the Proceedings have been recently published. The economics of low-rental housing received more attention than usual at this meeting. The titles and authors of the main speeches are: "Interrelation of Industrial Decentralization and Housing," by N. H. Engle; "Taxation as a Factor in Housing for Low-Income Groups," by Harold S. Buttenheim; "The Economics of Low Rent Housing," by Charles E. Pynchon; "Analysis of the Housing Problem of Low-Income Groups," by Arthur C. Holden; "The Role of Government in Housing," by James S. Taylor; "The Organization of Cooperative Housing for Workers," by Dr. Edith Elmer Wood; "Housing by Employers in the United States: The Problem of Company Towns and Company Housing," by Dr. Leifur Magnusson, and "Construction Materials for Low Cost Housing," by Dr. A. S. McAllister. 103 pp. 50c. (Apply to the School of Engineering, Pennsylvania State College, State College, Pa.)

Playgrounds

Playgrounds, Their Administration and Operation.—Prepared for the National Recreation Association; edited by George D. Butler. Published by A. S. Barnes and Company, Inc., New York, 1936. *x* + 402 *pp.* $3.00 *from* THE AMERICAN CITY.

This volume is designed for the use of three special groups: the playground authority whose task is to work out a satisfactory plan of operation and maintain an effective standard of service; the worker on the individual playground who must be prepared to meet the difficult problems involved in keeping a smoothly running program; and schools and colleges offering playground courses.

The material presented is confined as much as possible to the administration of a playground system and the operation of the individual playground. The problems involved come under the five headings of "Playground Plant," "Leadership," "Activities and Programs," "Administrative Problems," and "Problems of Operation." These five fundamental aspects of playground administration are treated in all their details: Plant layout and equipment, supplies and maintenance are considered. The selection, training and rating of leaders are discussed, and in addition the two important problems of junior leadership and volunteer workers. Methods of organizing and conducting activities are presented. The administrative problems of the central department are those of staff organization, record keeping, finance, and various types of regulation. Finally, problems of operation include safety, conduct and awards, and other concerns of the playground worker on the job. Many recreation workers have contributed their experience.

Housing

The Tenements of Chicago.—By Edith Abbott, Dean of the School of Social Service Administration, University of Chicago, assisted by Sophonisba P. Breckenridge and other associates. The University of Chicago Press, Chicago, Ill., 1936. *xx* + 505 *pp.* $5.00 *from* THE AMERICAN CITY.

Chicago has so long felt the need of better tenement house laws, better enforcement of these laws, and of other advances toward the improvement of housing conditions, that even away back in 1908, a series of studies of the different sections of the city was started by members of the faculty and groups of graduate students in the School of Social Service Administration of the University of Chicago. These studies have been continued over the past 25 years until 151 city blocks in widely separated neighborhoods were covered by methods of house-to-house canvassing, and 18,225 apartments or one-family dwellings were visited. This volume presents the material gathered over this period of years in the form of a history of tenement districts in Chicago. The growth and movements of population are traced from 1833 up to the present time, and especially interesting is the effect of the great influx of immigrants which was at a high pitch when these studies were begun. The deplorable, heart-rending conditions of life in the Chicago slums are depicted vividly in all stages of development. The several attempts to alleviate these conditions, often futile, are described. Special problems and special aspects of the struggle to maintain a decent home through the present depression are discussed. In conclusion, a number of suggestions in the direction of a large-scale public housing program are made.

State Parks

The Division of Forests and Parks of New Jersey has issued a series of leaflets on state parks and state forests. They are published for the information and convenience of visitors to and users of the properties, each one dealing with a separate property and giving a map and outlining its administration and facilities. (Apply to Department of Conservation and Development, State House Annex, Trenton, N. J.)

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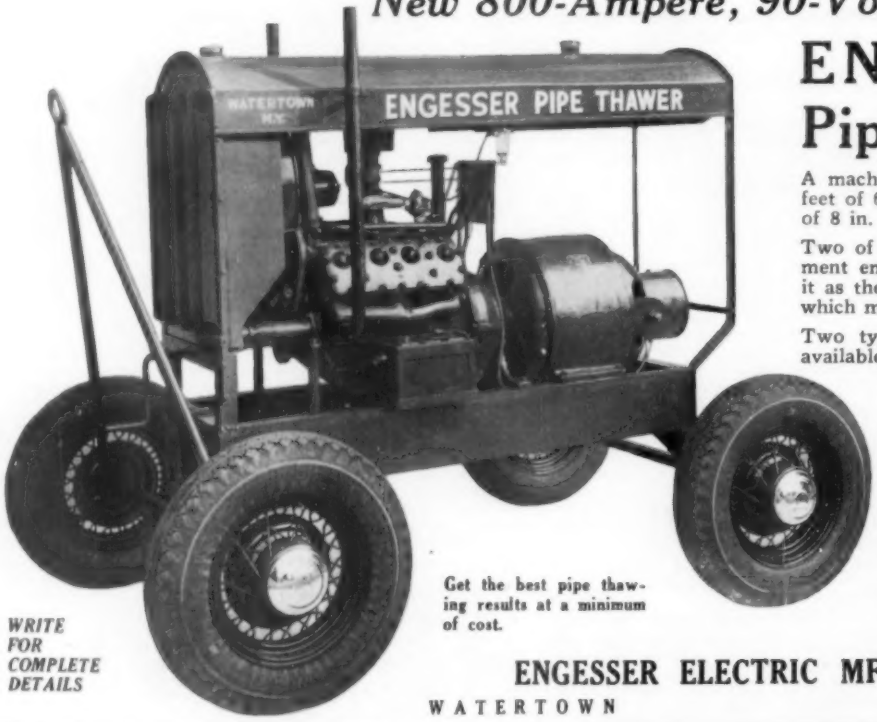

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Sewage Treatment

The Sewage Works Division of Grand Rapids, Mich., has published its Fifth Annual Report. The Fourth Annual Report was quite exhaustive in its description of the sewage-treatment works, but this later one also gives a brief non-technical picture of the various operations of the plant. There is in addition a technical description in which the units of equipment are listed in detail. Sections IV and V of the report present analytical records and graphs of several operations, and comparative cost analyses and tabulations. Appendix I is a survey of Grand River for the summer of 1934. The last part of the report is the financial section, which covers the budget and expenditures for the fiscal year ending March 31, 1935. 63 pp. (Apply to Treatment Works Div., Dept. of Public Service, Grand Rapids, Mich.)

Assessment Terminology

The Committee on Assessment Terminology of the National Association of Assessing Officers has prepared a tentative draft of a glossary of "Assessment Terminology." The difficult or controversial terms appearing in tax law and tax and appraisal literature which have direct bearing on the work of an assessor are defined. Particular attention has been given to appraisal, private accounting, legal, and architectural terms, as well as to those which belong more particularly to the field of taxation and public finance. 60 pp. (Apply to National Association of Assessing Officers, 850 E. 58th St., Chicago, Ill.)

Public Administration

The Joint Committee on Planning and Cooperation with headquarters in Brussels, Belgium, has published "A Directory of International Organizations in the Field of Public Administration." Under the definition employed, 205 organizations are described as to membership, finances, secretariat, activities, library, publications, and affiliations. Organizations concerning the many by-products of public administration appear in the list. Organizations having their principal interest in the political or legislative aspects of government have been excluded unless they also exhibit constructive interest in the art and science of public administration. This directory is the first comprehensive information on international organizations in the field which has been made readily accessible to Americans. It is hoped that it will prove a valuable part of the groundwork upon which cooperation and mutual assistance among international organizations, students of public administration, and public authorities throughout the world may be built up. xv + 174 pp. $1.50, prepaid. (Apply to Public Administration Service, 850 E. 58th St., Chicago, Ill.)

Sportsmanlike Driving

A second text pamphlet of the Sportsmanlike Driving series issued by the American Automobile Association is entitled "Driver and Pedestrian Responsibilities." Whether we are driving or walking on the public streets and highways, we are engaged in a social undertaking. Therefore, no matter how perfect our mechanical manipulation of a car may be, we cannot be expert drivers without a sportsmanlike attitude toward other drivers and pedestrians and a true appreciation of the tragedy of accidents. This pamphlet makes clear just what are the responsibilities of the driver and the pedestrian. It attempts to promote a better understanding of each other's problems and therefore a more responsible attitude in the position of each as an important factor in the safe, smooth functioning of the traffic system. 77 pp. (Apply to American Automobile Association, Washington, D. C.)

Police Training

More than 100 police officers attended the 4th Annual Police Training School of The League of Kansas Municipalities. The "Outline of Instruction" contains an hourly schedule of the classes and a summary of each lecture in outline form. In addition there are six appendices giving certain rules and uniform practices of police; and, finally, there is an article by Don J. Finney, the laboratory technician of the Police Department of Wichita, Kans., on "Police Duties at Crime Scenes." 184 + 39 + 46 pp. $4.00. (Apply to The League of Kansas Municipalities, Lawrence, Kans.)

Traffic

Alcohol plus gasoline: "Drunken Driving." The United States Conference of Mayors has published a survey comprising data from 102 large cities for 1935 which is an attempt to show the extent of the problem in various municipalities and the methods used to test intoxication and punish guilty drivers. During 1935, more than 40 per cent of the cities experienced a rise in the number of intoxicated drivers, 28 per cent noted a downward trend, and the remaining reported no change in the recent arrests for drunken driving. It is generally agreed that a much more reliable examination procedure to determine the fact of intoxication is necessary, and at the same time some means must be devised to make the physician's examination of real aid in obtaining convictions for drunken driving. The chief complaint of police officers is that the tolerant attitude of the public toward drunken driving often makes it necessary for prosecutors to reduce drunken driving charges to "reckless driving" or "speeding" in order that drunken drivers may receive some sort of punishment. 15 pp. (Apply to United States Conference of Mayors, 730 Jackson Pl., Washington, D. C.)

Motor Vehicle Speeds

"Motor Vehicle Speeds on Connecticut Highways" is an interesting survey based on actual observations at various chosen stations and key points. Two observers with their equipment, including two Eno Foundation Speed Detectors, mounted on camera tripods, recorded the speeds of 91,044 vehicles on 117 days from November 14, 1933, to September 26, 1934. The average speed turned out to be 38.9 miles per hour, the slowest vehicle was a heavy truck proceeding at 9 miles per hour on a wet pavement, and the highest speed, observed twice, was 80 miles per hour. In this pamphlet the methods of detection are explained, and all the data are presented with the proper accompanying conditions. 51 pp. (Apply to the Committee on Transportation, Yale University, New Haven, Conn.)

Local Government

Illinois has 17,136 local units of government, each having the power of taxation. The Illinois Chamber of Commerce has become interested in reducing the number of local units of government by consolidation or by elimination where these functions can be carried on as well or even better by other existing units of government. The first study toward such an end is "The Wasteful System in Local Government, An Analysis of the Expenditures of the Minor Governmental Units of Kane County, Illinois," by H. S. Hicks. The Chamber of Commerce feels that such surveys should be made for each county in Illinois, and that on the findings should be based a complete reorganization of Illinois local government. 24 pp. 25c. (Apply to Illinois Chamber of Commerce, 20 N. Wacker Drive, Chicago, Ill.)

Street Trades

The Street Trades Department of the Milwaukee Public Schools has issued its Annual Report. It is felt that only with the willing help of the school folk can the supervision of the 6,500 newsboys and other licensed street traders be made an educational project. The schools therefore have these boys organized into definite groups, known as school newsboys' clubs, under the advisorship of the principal or an interested teacher. This pamphlet lists the clubs and their advisors and summarizes their activities. The street trades law is outlined and the problems of licenses, inspections and enforcement are considered. 38 pp. (Apply to Milwaukee Public Schools Department of Municipal Recreation & Adult Education, Milwaukee, Wis.)

Town and Rural Government

The Cornell University Agricultural Experiment Station has published a series of pamphlets relating to the administrative affairs of certain towns and rural areas in New York State. The five bulletins are: "Variations in Town Taxes in New York," 43 pp.; "Local Government in Tomkins County, New York," 44 pp.; "Receipts and Expenditures of 876 New York Towns in 1934," 50 pp.; "Use and Value of Highways in Rural New York," 30 pp.; and "Rural Government in New York," 39 pp. (Apply to the Cornell University Agricultural Experiment Station, Ithaca, N. Y.)

Building Regulation

The League of Wisconsin Municipalities has prepared a first draft of a manual for the guidance of Wisconsin cities and villages in the establishment and operation of a building regulation department, entitled "A Municipal Building Regulation Department." The Introduction points out the desirable effects of building regulation. Most important is the assurance of safety it gives to the public. It insures that buildings which the public may use are not in danger of collapse, and have no potential fire hazards or unsafe or unsanitary plumbing. To the individual building owner it affords protection against financial loss through fraud by unscrupulous contractors.

This manual suggests a form of organization and procedure for a local building regulation department. Since conditions vary with the locality, the best possible applicable methods are presented wherever possible, with the intention that local conditions shall be the deciding factor in making a choice. 19 pp. + 5 sample permit application forms. (Apply to League of Wisconsin Municipalities, 114 N. Carroll St., Madison, Wis.)

Construction

"Varian's Handbook of Construction Data" is composed of a series of definitions, formulas and tables on weight of building materials per cubic foot, combined live loads on roofs in various parts of the country, number of bricks per superficial foot per course and amount of mortar required to lay 1,000 bricks, relative costs of material and labor for various classes of building work, covering capacity of paint, methods of figuring radiation, etc. The purpose of this book is to provide in convenient form useful information on building construction for architects, builders, engineers, realtors, appraisers, draftsmen, estimators, statisticians, and all the various building trades workers. 30 pp. $1.00. (Apply to Arthur W. Varian, P. O. Box 204, New Rochelle, N. Y.)

Standards on Coal and Coke

The American Society for Testing Materials in its work of promoting knowledge of the materials of engineering, and the standardization of specifications and the methods of testing, has issued a pamphlet entitled "A.S.T.M. Standards on Coal and Coke." This brings together the various A.S.T.M. methods for sampling, sieve and screen analysis, designating size, and for tests covering fineness, grindability, cubic foot weight, shatter, etc. Specifications cover gas and testing, and classification of coals by rank and by grade. 145 pp. $1.25. (Apply to American Society for Testing Materials, 250 S. Broad St., Philadelphia, Pa.)

Water Supply

A ground-water investigation of the Atlantic City Region is being prepared by the New Jersey State Water Policy Commission in cooperation with the United States Geological Survey. The second progress report, Special Report 6, is entitled "Supplementary Report on the Ground-Water Supplies of the Atlantic City Region." It covers the area immediately surrounding Atlantic City, dealing with the principal ground-water supplies, which are derived from the so-call'ed "800-foot sand," a member of the Kirkwood formation, and from the overlying Cohansey sands, known as the "100-foot" and "200-foot" sands. ix + 139 pp. (Apply to New Jersey State Water Policy Commission, 28 West State St., Trenton, N. J.)

Housing

"Housing and Child Welfare" is Research Bulletin No. 2 of the Housing Division of PWA, prepared by Mildred Hartsough and George Caswell. In the bulletin consideration is given to the safety and welfare of the child as affected by household space, type of structure, immediate home surroundings, recreation space, community facilities, neighborhood planning, and the development of community integration. "The present tendency for the home to lose its primary social importance can be halted only by a fundamental change in social trends. The home must become once more the center of the family's social activities. It will then best serve the welfare of children of all ages. But first the home itself must be made adequate." 51 pp. (Apply to Federal Emergency Administration of Public Works, Housing Division, Washington, D. C.)

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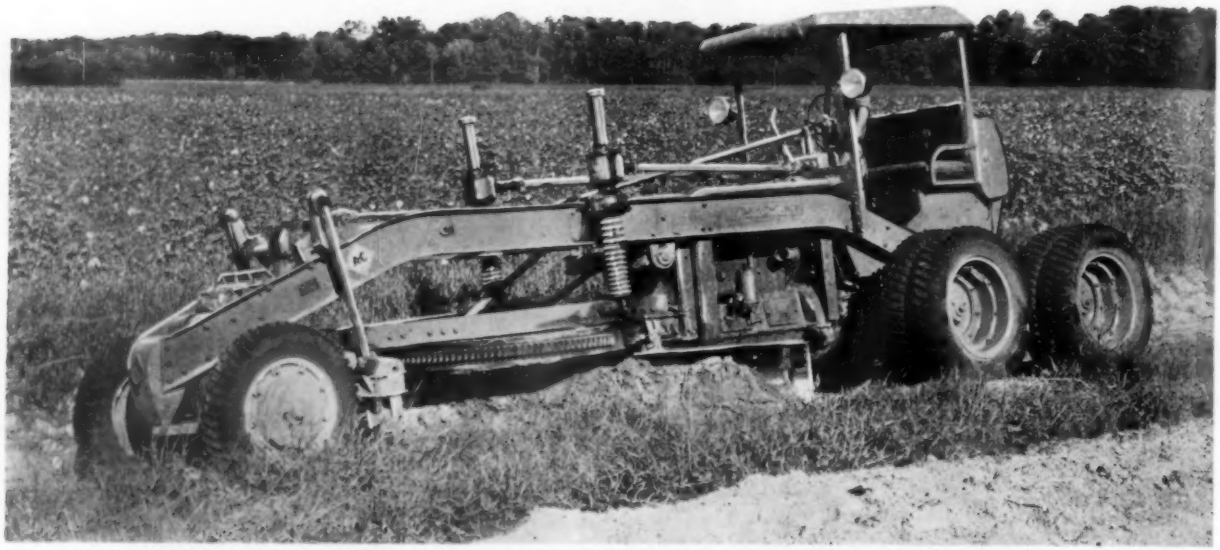

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Housing

The New York City Housing Authority has published the second of a series of brochures on housing. "Wages, Slums and Housing, A Few Questions and Answers," by Langdon Post, has been written in reply to a number of representative questions on these complicated problems which flood the mails of the Authority each day. "Isn't the primary cause for the slums and the crime and disease in the slums due to adverse economic conditions?" "Would it not be more logical for the Government to provide adequate old age pensions, unemployment insurance and minimum wage laws rather than to become involved in long-range housing plans?" "What guarantee do we have that crime will be decreased if the people now living in the slums are moved into modern structures?" "Who pays for the slums?" "Wouldn't the construction of Government-subsidized houses create rather than eliminate classes in America?" The pamphlet contains answers to these specific questions. 16 pp. (Apply to New York City Housing Authority, 10 E. 40th St., New York.)

Rural Zoning

"Twenty-three northern and central Wisconsin counties have, during the past four years, planned, developed, and enacted comprehensive county-wide rural zoning ordinances. A total of more than five million acres of land—much of it tax-delinquent and most of it non-agricultural—has now been officially closed to agricultural development and legal settlement. The lands so restricted may be more profitably devoted to forestry, recreation, game management, water conservation and special industrial uses, while the better agricultural lands in already established communities will meet the demand for new farms for many years."

This quotation is from "Rural Zoning Ordinances in Wisconsin," a 40-page pamphlet by W. A. Rowland and F. B. Trenk which treats the subject of rural zoning quite thoroughly. From the same source and also by W. A. Rowlands, comes a specialized 6-page paper entitled "Rural Zoning, Its Influence on Public Health and Schools." Through rural zoning ordinances the problem of migrant population dwelling in abandoned shacks, a great public health menace, could be met. Rural zoning should be a useful instrument in effecting the proper location and size of community units throughout a state in relation to the most efficient local government set-up and school system. (Apply to Extension Service of the College of Agriculture, The University of Wisconsin, Madison, Wis.)

Smoke Prevention

In answer to a demand for information concerning existing ordinances dealing with the various phases of smoke abatement work, the Smoke Prevention Association circulated a questionnaire among cities which have had some experience in the matter and has compiled the results in an 80-page pamphlet. In addition to the information on existing ordinances, the "Manual of Smoke and Boiler Ordinances and Requirements" contains several interesting articles on smoke abatement, air pollution, and fuel combustion which should be of material aid in solving the problem of cleaning up smoking chimneys. 50c. (Apply to Smoke Prevention Association, Inc., City Hall Square Bldg., Chicago, Ill.)

Social Work

Proceedings of the National Conference of Social Work, Atlantic City, 1936.—Edited by the Editorial Committee of the National Conference of Social Work. The University of Chicago Press, Chicago, Ill. xi + 655 pp. $3.00 *from* THE AMERICAN CITY.

A selection has been made for publication of significant papers presented at this conference. The resulting volume covers all phases of social work activity, philosophical and practical. A number of the problems discussed have sprung from recent depression hardships and new social legislation and should be of great interest to all persons interested in our pressing social difficulties. The prize-winning paper, entitled "Employment Planning," by Paul U. Kellogg, editor of *The Survey*, deals with the vital issues of unemployment and social security.

Other Reports Received

CHICAGO, ILL.—Report of the Comptroller, 1935. 158 pp.

CHICAGO, ILL.—Sections of the Revised Chicago Code of 1931 Relating to Refrigeration, with Amendments up to and Including October 1, 1936. 12 pp.

CHICAGO, ILL.—Annual Report, Department of Streets and Electricity, 1935. 37 pp.

NEWARK, N. J.—Annual Report, Auditor of Accounts, 1935. 283 pp.

SANTA BARBARA, CALIF.—Annual Report, Fiscal Year 1935-1936. 20 pp.

SPOKANE, WASH.—Building Code, Ordinance No. C5781, passed by the City Council, October 13, 1936. 58 pp.

Conventions -- When and Where

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

DECEMBER 4-5.—PHILADELPHIA, PA.
National Association of Housing Officials. Annual meeting. Secretary, Coleman Woodbury, 850 East 58th Street, Chicago, Ill.

DECEMBER 7-10.—SAN FRANCISCO, CALIF. (375)
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1220 National Press Building, Washington, D. C.

DECEMBER 10-11.—DAYTONA BEACH, FLA. (200)
Florida League of Municipalities. Annual convention. Secretary-Treasurer, E. P. Owen, Jr., 1201 Lynch Building, Jacksonville, Fla.

DECEMBER 10-11.—BOISE, IDAHO.
Idaho Municipal Officers' Association. Biennial meeting. Secretary, George C. Huebener, Emmett, Idaho.

DECEMBER 29.—NEW YORK.
American Water Works Association—New York Section. Meeting. (Hotel New Yorker.) Secretary, R. K. Blanchard, Care Neptune Meter Co., 50 East 42d Street, New York.

JANUARY 8-9.—BOSTON, MASS.
Massachusetts State Association of Selectmen. Annual meeting. Executive Secretary, Axel E. Zetterman, Hotel Westminster, Boston, Mass.

JANUARY 11-15.—NEW ORLEANS, LA.
American Road Builders' Association. Convention and Exhibit. (Municipal Auditorium.) Engineer-Director, Charles M. Upham, 952 National Press Building, Washington, D. C.

JANUARY 20-22.—NEW YORK.
American Society of Civil Engineers. Annual meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

JANUARY 21-23.—NEW YORK. (100)
New York State Sewage Works Association. Annual meeting. Secretary-Treasurer, A. S. Bedell, State Department of Health, Albany, N. Y.

JANUARY 25-29.—NEW YORK.
American Institute of Electrical Engineers. Annual winter convention. National Secretary, H. H. Henline, 33 West 39th Street, New York.

JANUARY 25-27.—ST. LOUIS, MO. (300)
American Society of Heating and Ventilating Engineers. Annual meeting. Secretary, A. V. Hutchinson, 51 Madison Avenue, New York.

JANUARY 25-29.—WEST LAFAYETTE, IND. (800)
Purdue Road School. (Purdue University.) Address: Prof. Ben H. Petty, Engineering Extension Department, Purdue University, West Lafayette, Ind.

JANUARY 27-29.—DETROIT, MICH.
National Paving Brick Association. Annual meeting. (Book-Cadillac Hotel.) Managing Director, G. F. Schlesinger, 1245 National Press Building, Washington, D. C.

FEBRUARY 15-20.—COLLEGE STATION, TEXAS.
Texas Water Works Short School. Annual session. Address: V. M. Ehlers, Secretary of the Southwest Water Works Association—Texas Section, Austin, Texas.

FEBRUARY 16-18.—ANN ARBOR, MICH. (500)
Conference on Highway Engineering—University of Michigan. Annual convention. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

FEBRUARY 23-26.—NEW YORK. (500)
American Concrete Institute. Annual convention. (Roosevelt Hotel.) Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

FEBRUARY 24-26.—NEW YORK. (1,000)
Association of Highway Officials of North Atlantic States. Annual convention. (Hotel Pennsylvania.) Secretary-Treasurer, A. Lee Grover, State Highway Commission, Trenton, N. J.

MARCH 21-23.—HOUSTON, TEXAS. (200)
Southern Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Stanley Draper, Manager, Chamber of Commerce, Oklahoma City, Okla.

MARCH 25-26.—PHILADELPHIA, PA.
American Water Works Association—Four States Section. Annual meeting. Secretary-Treasurer, C. H. Becker, 400 Chestnut Street, Philadelphia, Pa.

MARCH 30—APRIL 1.—Place to be announced later.
American Water Works Association—Florida Section. Annual meeting. Secretary, J. R. Hoy, 404 Hildebrandt Building, Jacksonville, Fla.

APRIL 6-8.—Place to be announced later.
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 135 State Capitol Building, Atlanta, Ga.

APRIL 8-10.—BOISE, IDAHO. (300)
Pacific Northwest Regional Planning Commission. Conference. Chairman, Marshall N. Dana, 220 Federal Court House, Portland, Ore.

APRIL 12-14.—CHATTANOOGA, TENN.
American Water Works Association—Kentucky-Tennessee Section. Annual meeting. (Hotel Patten.) Executive Secretary, Howard D. Schmidt, 420 Sixth Avenue North, Nashville, Tenn.

APRIL 14-16.—MONTREAL, CANADA.
American Water Works Association—Canadian Section. Annual meeting. (Windsor Hotel.) Secretary-Treasurer, Dr. A. E. Berry, Ontario Department of Health, Parliament Buildings, Toronto, 5, Ont.

APRIL 19-22.—LEWISTON, MONT.
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

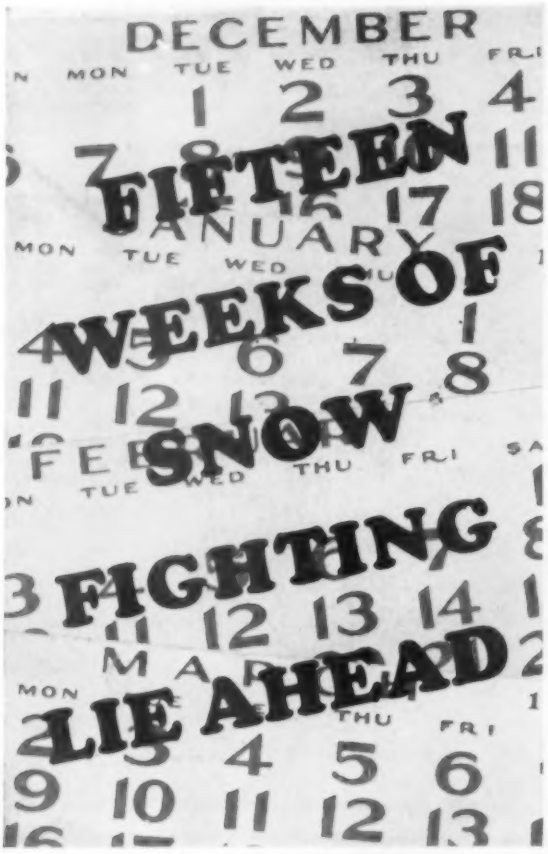
JUNE 7-11.—BUFFALO, N. Y.
American Water Works Association. Annual convention. (Hotel Statler.) Secretary, Harry E. Jordan, 29 West 39th Street, New York.

JUNE 21-25.—MILWAUKEE, WIS.
American Institute of Electrical Engineers. Annual summer convention. National Secretary, H. H. Henline, 33 West 39th Street, New York.

JULY 5-13.—(APPROXIMATE).—PARIS, FRANCE.
Housing and Town Planning Congress. International Federation for Housing and Town Planning. Organizing Secretary, H. Chapman, 25 Bedford Row, London, W. C. 1, England. *International Housing Association.* General Secretary, Prof. Franz Schuster, Hansa-Allee 27, Frankfort a/M, Germany.

AUGUST 30-SEPTEMBER 1.—ATLANTIC CITY, N. J. (75)
National Identification Association. Annual convention. (Hotel Madison.) Secretary-Treasurer, E. W. Livingston, Jamesville, N. Y.

OCTOBER 11-14.—AUSTIN, TEXAS.
American Water Works Association—Southwest Section. Annual convention. Secretary-Treasurer, Lewis A. Quigley, 3320 West Berry Street, Fort Worth, Texas.



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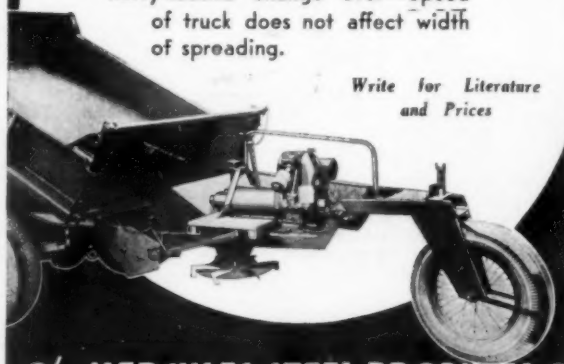

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You need Simplex-LATOX lead covered Cables, made to meet your special requirements. They will be a valuable addition to your fire and police protection.

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Meter Company Celebrates Its 1,000,000th Meter

It is historically of interest to realize that the man who stamped the serial number 1 on the first meter ever built by the Buffalo Meter Co., Buffalo, N. Y., on April 26, 1893, stamped the serial number 1,000,000 on a Buffalo meter on November 9, 1936. George B. Bassett, who has seen these 1,000,000 meters manufactured, left the water-works designing and construction business to establish a company for the manufacture of meters in 1892. After months of manufacture of patterns and tools, the first meter was assembled and calibrated, and the serial number affixed. Meter No. 1 was a Niagara iron case meter of the conical disc, solid casing type. Meter No. 1,000,000 is an American bronze case, frost bottom meter. Following the completion of the first million meters, the second million was started immediately, and No. 1,000,001 is a Niagara solid casing meter of the modern flat disc type.

PRESIDENT GEORGE B. BASSETT STAMPING THE SERIAL NUMBER ON THE 1,000,000TH BUFFALO METER

New Research Laboratory for American Rolling Mill

Construction of a modern research laboratory to replace the structure which was leveled by an explosion in December, 1935, has been announced by the American Rolling Mill Co., Middletown, Ohio. Since the demolition of the laboratories, the management has been studying the problem and has decided to proceed with the construction of a new building with proper and modern facilities to house this extensive research program, which has already resulted in many special grades of iron and steel sheets.

The building, to be erected in Middletown, will be constructed of porcelain-enameled sheets, other decorative metal products, and glass blocks, at a cost of about $260,000, exclusive of equipment. A multiple-story building of equal floor space but of conventional construction would cost about $400,000, according to the announcement.

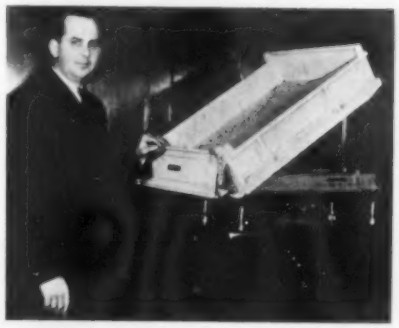
The laboratory, a single-story building designed and to be erected by The Austin Company, is the outgrowth of extensive research which has led to the use of sheet iron and steel as building materials. Charles R. Hook, President of The American Rolling Mill Co., points out that this building will demonstrate the full force which low-priced sheet and strip steel can exert in reviving construction activities. The building will provide an area of 41,900 square feet on one floor and an additional 1,600 square feet for use in X-ray testing and other research in the square entrance tower. Although there are to be more than 100 individual offices, laboratories, conference rooms, etc., abundant daylight will be furnished in all sections through vertical saw-tooth monitors closed in with glass block in continuous sections, 175 feet long and 10 feet high.

Dow Opens Chicago Office

The Dow Chemical Co., Midland, Mich., manufacturer of calcium chloride, has announced the opening of a Chicago branch office, located in the Field Building, 135 South La Salle Street, Chicago.

Working Models Stimulate Keen Interest

W. H. Hammond, Sales Manager, Hoist and Body Division, Gar Wood Industries, Inc., believes that miniatures stimulate keen interest in his company's products, as they attract large crowds at show exhibits and effectively demonstrate the sales features in a dramatic way. Mr. Hammond is shown standing beside a miniature of the hydraulic hoist and dump-truck body assembly manufactured by Gar Wood. This mechanical, working miniature was exhibited at the 1936 Public Works Congress in Toronto and will be placed on exhibition at the American Road Builders' Association Show in New Orleans, January 11-15, 1937, and also at the Southwest Road Show, Wichita, Kansas, February 23-26, 1936.



W. H. HAMMOND, SALES MGR., HOIST AND BODY DIVISION, GAR WOOD INDUSTRIES, INC.; AND A WORKING MODEL OF A HOIST AND DUMP BODY

Gamewell Orders

Gamewell has been showing a steady increase in orders for a number of months, culminating during October, 1936, in the largest volume received in any month since 1929. All its lines have shared in this recovery, resulting in a number of large contracts being placed for sprinklers, motors, traffic signals, and municipal fire and police signaling systems.

Sacramento, California, has recently awarded Gamewell a contract for a complete new signaling system under a PWA contract amounting to $177,000. There has been a marked improvement in the purchasing power of the average municipality, which is making possible appropriations for long-needed equipment, according to V. C. Stanley, President of The Gamewell Co. The restriction of buying power for six years has resulted in a walled-up need for normal replacements and betterments. Continued good operating conditions are anticipated.

ARCHITECT'S DRAWING OF THE NEW RESEARCH BUILDING TO BE BUILT BY ARMCO

GAR WOOD

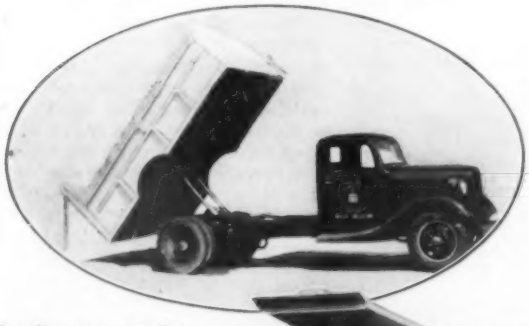
GARBAGE BODIES

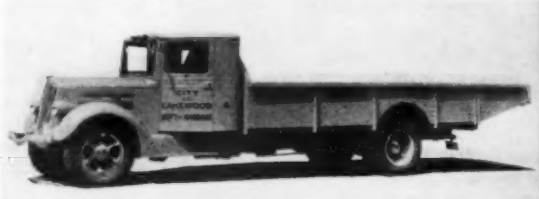
RUBBISH BODIES

Gar Wood garbage and rubbish units provide the best features of design and construction necessary for municipal collection service. Let us help you with your own particular requirements.

Below: D66 hoist, with L12 body equipped with hinged steel covers. Total capacity, 9 cu. yds.

Above: Model T33 underbody telescopic hoist, installed with large capacity, low mount garbage body.



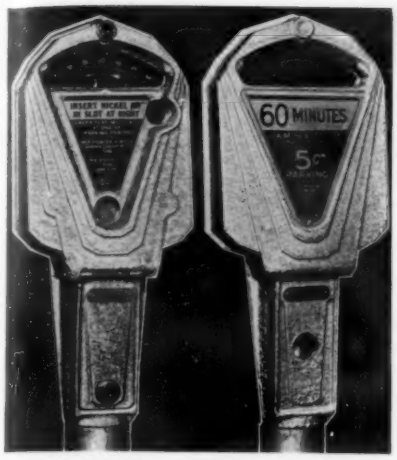


Note the extremely low mounting obtained.

15 units were recently purchased by the City of Columbus, Ohio.

SEE YOU AT THE ROAD SHOW

GAR WOOD INDUSTRIES, INC., DETROIT, MICHIGAN



THE FRONT AND BACK OF THE NEW METER OF THE DUAL PARKING METER CO.

Improved Parking Meter

A new automatic parking meter, which is the result of fourteen months' experience, and which has overcome the mechanical problems that have presented themselves during this period of time, has been announced by the Dual Parking Meter Co., Oklahoma City, Okla. The new meter has two compartments. The upper compartment is for the mechanism and is opened only when there is some mechanical problem, thus reducing the possibility of dust, rain and snow getting into the works. The second or lower compartment is for the coin box exclusively.

On the back of the meter there is a window through which the coin box may be observed to see if it is in its right position. The action of the mechanical element has been speeded up in definiteness of operation, and many practical refinements have been devised which make this model closer to the perfection desired. The head is locked on from the inside of the coin chamber by a lug which pulls up between four prongs and makes the head more substantial in this position than if the meter and post were in one piece.

Toledo, Ohio, and Lubbock, Texas, are the first cities to install these newest Dual automatic meters, with 1,000 and 350, respectively. Long Beach, Calif., is just now installing 400 of these new automatic meters.

Arthur T. Clark Joins Barrett Co.

Arthur T. Clark, Superintendent and Engineer of the Department of Water, Morristown, N. J., has resigned to become associated with The Barrett Co., 40 Rector Street, New York, in connection with the Engineering and Sales in the Pipe Coating Department for oil, gas and water mains.

Mr. Clark has previously been associated with several large water companies in the East and has always taken great interest in the prevention of corrosion, which is one of the major causes of the reduction of flow in mains.

Brick Association to Hold Annual Meeting in Detroit

The 31st annual meeting of the National Paving Brick Association will be held in Detroit, Mich., January 27, 28 and 29, 1937, at the Book-Cadillac Hotel, with most of the sessions open to the general public and those interested in street and highway development.

The program will consist of papers and discussions by prominent engineers and contractors experienced in the use of paving brick. Recent important developments in paving brick production and utilization, including descriptions of modern brick street and highway paving and resurfacing projects, will be presented. The Research Bureau maintained by the National Paving Brick Association at the Ohio State University Experiment Station will present a resumé of its work, and there will be reports on recent research on fillers, bed courses and methods of laying brick, which include both laboratory and service tests.

O. W. Renkert, of the Metropolitan Paving Brick Co., Canton, Ohio, is President, and George F. Schlesinger is Chief Engineer and Secretary, of the National Paving Brick Association.

Low-Head Pumps for Drainage and Sewage

Fifteen years ago, with a background of 25 years of centrifugal pumping experience at that time, the Worthington Pump & Machinery Corporation, Harrison, N. J., pioneered the modern large-capacity low-head pumps utilizing the "mixed-flow" principle to increase the rotative speeds, reduce the size and bulk and reduce the cost of the installation. Today, Worthington Mixflo low-head pumps are used by the Connors Creek Station, Detroit, Mich.; Peoria, Ill.; Grand Rapids, Mich.; Super Power Co. of Illinois; Fourth Jefferson Drainage District, New Orleans, La.; U.S.S. Aircraft Carrier Ranger; Columbus, Ohio; and Sutters By-pass, Sacramento, Calif., and others.

These pumps are available in sizes from 12 to 84 inches for capacities from 1,000 to 225,000 gallons per minute and for heads from 5 to 50 feet. The Mixflo design, which permits higher rotative speeds for a given capacity and head, also produces a steep head-capacity characteristic, so that the capacity variation is small for a wide variation in head. The pump is so arranged that it can be started dry and brought up to normal speed before priming, thus permitting the use of low starting-torque drivers.

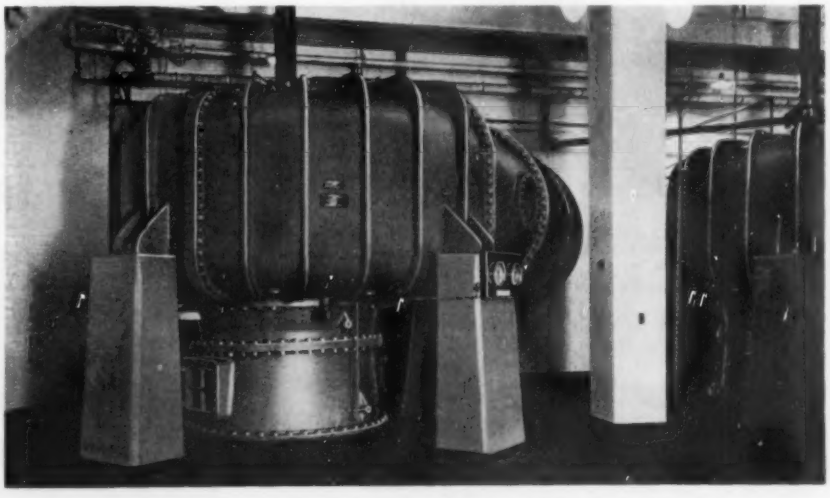
Mixflo pumps are used for a wide variety of installations, such as: direct-connected to horizontal synchronous or induction motors; gasoline, diesel or gas engines; vertical floor-mounted, either close-coupled or connected through shafting to vertical electric motors, gears or steam turbines; vertical dry-pit mounted and connected to vertical motors, gears, or steam turbines by open shafting, or drop pipe mounted for wet-pit service. Their widest field of application has been in drainage and sewage pumping, irrigation and condenser circulation service.

Flow Meter Engineering

The Brown Instrument Co., Philadelphia, Pa., has published a 162-page handbook on flow meter engineering which covers every phase of the subject including principles, designs, applications and installations, and the data cover all types of fluid-measuring with orifices.

This handbook is divided into: general flow meter engineering; orifice design; steam flow measurement; water flow measurement. All theories are illustrated with charts, photographs and sample problems such as are encountered every day by engineers.

The Brown Flow Meter Engineering Handbook is an attractively bound volume printed on highly coated paper and durably bound. Orders for this book at $2.00 each should be addressed to the Brown Instrument Co., Division of Minneapolis-Honeywell Regulator Co., Wayne and Roberts Avenues, Philadelphia, Pa.



ONE OF FIVE 84-INCH WORTHINGTON VERTICAL MIXFLO PUMPS AT THE CONNORS CREEK STATION, DETROIT, MICH.
Total capacity over 1,000,000 gallons per minute

Automatic PARKING METERS

Control Parking . . . Aid Motorists
Help Business . . . Promote Safety
Aid Traffic Enforcement

As the result of more than a year of actual operation experience, the obsolete handle-type Parking Meter has been re-designed, and a greatly improved Automatic meter manufactured. This new design has made all operations automatic from the moment the nickel is dropped in the slot. There is no handle, therefore there's not a chance that the motorist will, after inserting a coin, forget to turn the handle necessary to put the meter into operation; no stopping of machine on "dead" center; nothing for kids to tamper with, causing damage or trouble.

Successful . . . Say Merchants and Motorists

"We are only too glad to inform others of their big success here." . . . Frisbie Realty Co., Kansas City.

"I have been won over and now heartily endorse them." . . . C. C. Peters, Emery, Bird, Thayer Co., Kansas City.

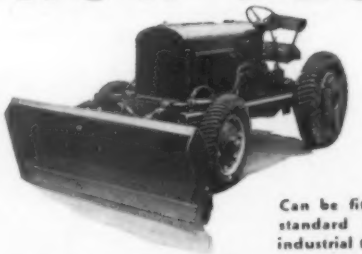
"The reaction from merchants has been one of entire satisfaction. The meter is sound. I predict cities all over the United States will adopt it." . . . Harrison, Oklahoma City Times.

"Parking Meters are very popular in Ft. Worth with the public." . . . Monnig, Monnig Dry Goods Co., Ft. Worth, Texas.

DUAL PARKING METER CO.

Commerce Exchange Bldg. ***Carl C. Magee, President*** Oklahoma City, Okla.

The GAR WOOD CROSSWALK SNOW PLOW



Can be fitted to any standard wheel-type industrial tractor.

A new tool particularly valuable to street maintenance departments of cities and towns is now available for clearing snow easily, swiftly and economically. An exclusive feature is the independent knee-action device built into the moldboard to clear manholes and other obstructions.

Especially valuable is the positive control of the cutting depth of the blade with the use of two "double-action" hydraulic jacks. This exclusive feature not only makes the unit an excellent snow plow but a year-'round machine for light-duty grading, leveling rubbish dumps and other types of bulldozing.

For complete details, wire or write

Road Machinery Division
GAR WOOD INDUSTRIES, INC.
Detroit, Michigan

EVERYTHING IN SEWER CLEANING EQUIPMENT

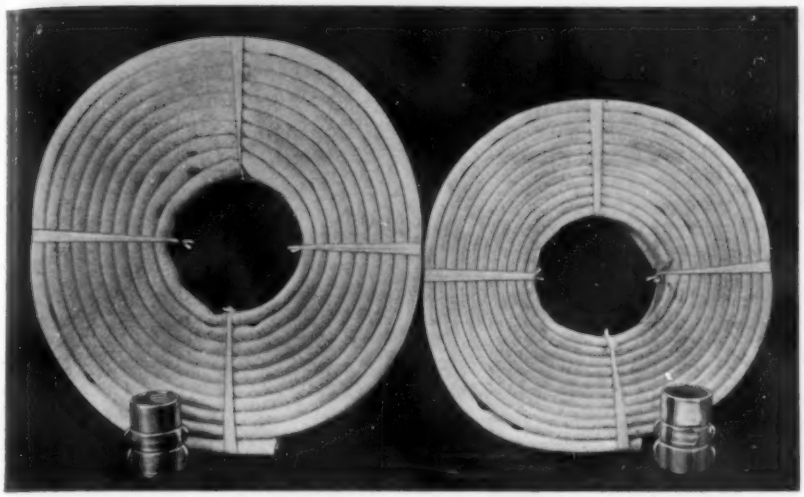
WRITE FOR CATALOG

TURBINE SEWER MACHINE CO.
52nd and W. State Streets MILWAUKEE, WIS.

HAPPINESS AHEAD

Activated Alum Corp.

Main Office: 80 BROAD STREET NEW YORK



THE ROLL OF HIGHFLEX FIRE HOSE SHOWN AT RIGHT IS THE SAME AS TO LENGTH, SIZE, STRENGTH AND BURST RESISTANCE AS THE ROLL OF STANDARD GOODRICH FIRE HOSE ON THE LEFT, YET IT WEIGHS 18 PER CENT LESS

Municipal Fire Hose of Greater Flexibility

To meet the demand for fire hose of greater flexibility, The B. F. Goodrich Co., Akron, Ohio, has announced an addition to its line, to be known as Highflex. This new hose is a double-jacket municipal fire hose incorporating a new method of construction which makes possible a compact, highly flexible hose weighing 18 per cent less than previous types, yet is said to be of equal strength and burst resistance.

Refinements in weaving, use of special yarns, and modern methods of rubber compounding, which permit the use of a thinner gage without sacrificing smoothness or resistance of ageing and flexing, have enabled the manufacturer to reduce the wall thickness of the hose 1/16-inch, thereby reducing its weight without lowering its strength. Through the use of a slightly oversize tube, the outside diameter remains the same as that of other hose, which permits attachment of standard couplings.

The flexibility of Highflex hose has been obtained without resorting to an open weave. The jackets are closely woven and free from open spaces, and completely cover the pressure-resisting filler strands. This hose is available in the 2½-inch size and may be had with or without Goodrich Hydroseal moisture-resisting treatment.

Pittsburgh Meters Now Have Proportioneers Equipment

The Pittsburgh Equitable Meter Co., Pittsburgh, Pa., has announced a complete line of its liquid meters equipped with Proportioneers Tret-O-Units as manufactured by Proportioneers, Inc., Providence, R. I. Typical applications include automatic proportional chlorination for water works, swimming pools or sewage-treatment plants. They are also used for conditioning boiler feed water and have many industrial applications. A new bulletin describing the operation and application of these products may be secured from the meter company by asking for Bulletin W-520 and mentioning THE AMERICAN CITY.

Sewage Aerator and Clarifier in One Tank

A new piece of sewage-treatment equipment, designed particularly for the smaller municipalities with populations up to 4,000 where the advantages of the activated sludge process for the complete treatment of sewage is desired, has been announced by the Chicago Pump Co., 2336 Wolfram Street, Chicago, Ill. This combination aerator-clarifier performs the aeration and clarification phases of the activated sludge process in a single tank and is reported to effect reductions in the B.O.D. up to 98 per cent. The equipment requires less than two hours' manual supervision daily.

In operation, sewage is drawn from the primary settling tanks into the aeration tank through a pipe or channel at the periphery of the tank surface. The mixed sewage and activated sludge are drawn through the bottom of the draft tube and discharged uniformly against the surface of the diffuser cone by the propeller. The propeller discharge falls from the diffuser cone in thin mushroom-shaped sheets onto the splash plate, the vanes of which effect a turbulent discharge onto the aeration tank surface. The discharge from the splash plate imparts a rotary motion to the tank contents, directed to the outside walls.

Absorption of oxygen is effected at four points: in the hollow-cone discharge from the propeller; as the diffuser cone discharge falls to the splash plate; in the turbulent flow across the jumps on the splash plate; and by the agitation of the tank surface caused by the splash-plate discharge. Continuous mixing and circulation of the activated sludge with the sewage is effected at these points and by the vertical, spiral flow from the surface to the draft tube entrance. High velocities eliminate sludge settlement.

Aerated mixed liquor enters the clarifier compartment at the center through the annular opening between the inner and outer clarifier shells, and travels downward. The velocity decreases as the mixed liquor enters the clarifier compartment, resulting in the deposition of the sludge. The clarified liquor rises at a low velocity and flows into the effluent conduit through the V-notch weirs. A pipe connected to the low point of the effluent conduit discharges the clarified effluent into a chamber for disposal.

The activated sludge settles through the annular opening between the hopper bottom and the draft tube, and is sucked into the draft tube with the incoming mixed liquor. Excess activated sludge is continuously settled in the waste sludge pit. A portion of the mixed liquor in the aeration-tank flows into the waste sludge pit through a diversion vane. The suddenly decreased velocity of flow through the pit results in the deposition of the activated sludge.

Armco Advertising to N. W. Ayer

The American Rolling Mill Co., Middletown, Ohio, has placed its advertising account with N. W. Ayer and Son, Inc.

CROSS-SECTION OF THE NEW COMBINED SEWAGE AERATOR AND CLARIFIER FOR SMALL ACTIVATED SLUDGE PLANTS

AMERICAN

SEND TODAY FOR COMPLETE 48-PAGE CATALOG

PLAYGROUND EQUIPMENT

CITIES in every section of the country USE and ENDORSE American play apparatus. Actual experience has PROVED that American devices will OUTLAST and OUTPERFORM all other makes. Swings, Slides, See-saws, Ocean Waves, Merry-go-rounds and a hundred other devices, all designed and constructed for utmost STRENGTH, DURABILITY and SAFETY. Send for information and prices.

AMERICAN
PLAYGROUND DEVICE CO.
ANDERSON - - - INDIANA

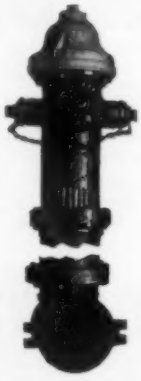
Power Driven

Write for Literature

GRAVELY SIDEWALK SNOW PLOW

Effectively clears paths 40-54" wide. Goes in places you wouldn't think of taking a big plow. Attach it to your GRAVELY MOWER and you have a first-rate all-year machine.

Gravely Motor Plow & Cultivator Co., Dunbar, W. Va.



Johnson City Fire Hydrant

Not just another hydrant—but one designed to overcome difficulties heretofore troublesome to water works men and fire chiefs . . . with an *extra factor of safety* for severe service.

Not easily damaged; but *if* ever injured, easily and quickly repaired without shutting off the line and without digging.

Write for circular giving complete details.

Johnson City Foundry & Machine Co.
Johnson City, Tenn.

WHAT PRICE DELAYED ALARMS?

FIRE LOSS— $4,000,000,000

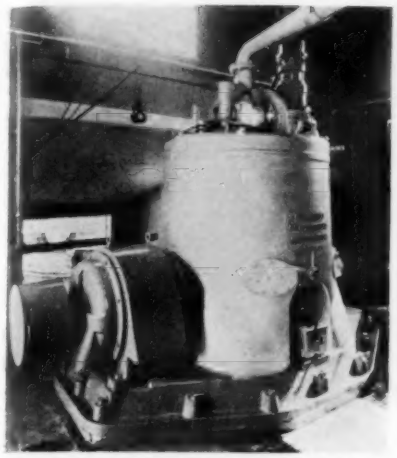
Statistics compiled and published show the national fire loss for ten years—1926 to 1935 inclusive—to be in excess of the above figure.

Nearly all fires may be extinguished in their incipiency by a bucket of water.

The *Fire Alarm Box* is the only available and ever accessible means for transmitting fire alarms *directly* to the *fire department.*

Are your citizens not entitled to this protection?

THE GAMEWELL CO.
NEWTON MASSACHUSETTS



THE CENTRIFUGAL DEWATERING UNIT MADE BY THE CANADIAN CENTRIFUGAL CORPORATION AND THE AMERICAN CENTRIFUGAL CORPORATION, NEW YORK CITY

A Centrifugal Machine for Dewatering Sludge

A machine which operates on the principle of the centrifugal cream separator has been developed for the dewatering of sewage sludge. The first installation in Canada at the North Toronto sewage-treatment plant was inspected by members of the International Association of Public Works Officials and the Institute of Sewage and Sanitation of Canada in September. The identical machine is being manufactured in the United States by the American Centrifugal Corporation, 115 Broadway, New York.

The machine is automatic in operation, and when started by the push of a starter button, continues to repeat its cycle until stopped by the operator. The machine may be operated at rates ranging from 10 to 60 gallons of sludge per minute, depending on the per cent of solids in the wet sludge. The machine operates at from 3 to 6 cycles per hour, producing approximately 600 pounds of sludge cake of from 60 to 65 per cent moisture per cycle, resulting in approximately 600 to 900 pounds of dry solids per hour.

A cycle consists of feeding the wet sludge to the machine, shutting off the feed, starting the centrifugal and bringing it up to speed for a predetermined time, then decelerating the centrifugal dewatering unit, and shredding the cake and discharging it from the machine vertically onto a conveyor running directly below the machine.

Reports indicate that the effluent from the machine contains from 0.5 to 1 per cent of suspended solids. Approximately 40 per cent of these solids are fats and greases which may be skimmed off in a simple degreasing tank. The disposal of the effluent is dependent upon the character of the plant, but normally it is returned to the incoming sewage.

The machine installed in Toronto weighs 20,000 pounds, and the maximum speed for dewatering is 2,000 rpm, which develops a separating intensity of more than 2,500 times that of gravity. With this pressure, the cake is compressed under an average pressure of 600 pounds per square inch. The continuous operation of this machine for 8-hour periods in Toronto with 50 per cent activated sludge and 45 per cent primary sludge has been done successfully, delivering 5 tons of dry solids in the 8 hours.

Paint Spray Outfit for City Services

Municipal department heads, whose problems include the repainting of equipment, buildings, traffic guides, hydrants, and other structures and objects important in municipal service, will be interested in a new paint spray outfit announced by the Saylor-Beall Manufacturing Co., Detroit, Mich. This outfit includes a small air compressor, a spray gun, and the necessary hose and nozzle connections. It is equipped with both internal and external nozzles, a feature which makes it available for the many varied jobs it is called upon to do in municipal departments.

A NEW GENERAL UTILITY PAINT SPRAY OUTFIT

Low-pressure internal atomizing, because of its economy, is used for applying most liquids, since such nozzles give the greatest coverage per cubic foot of air used. On the other hand, some materials, like the new fast-drying lacquers, must be atomized after they leave the gun. The Saylor-Beall gun can be quickly changed to handle such materials, giving an all-purpose spray at a small investment.

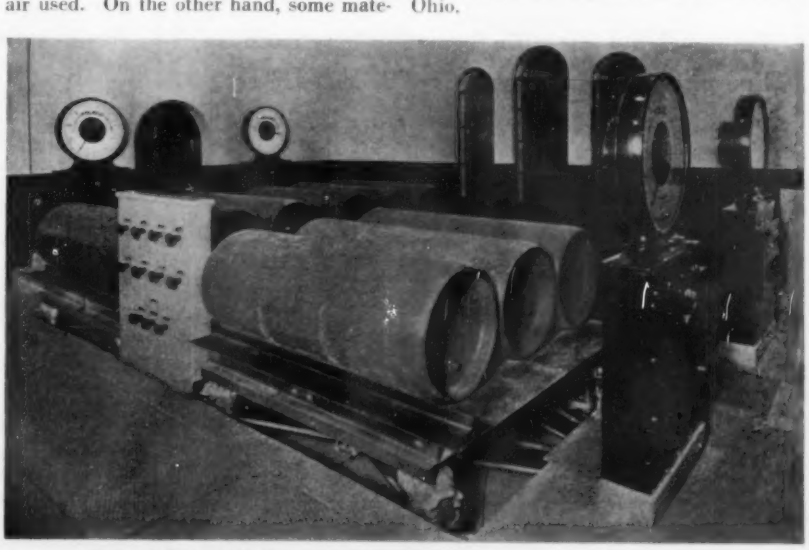
Automatic Scales for Chlorine Cylinders

Millions of people drink chlorinated water in the United States, but few stop to think of the careful checking that the quantity of chlorine applied receives. In Montreal the checking of the quantity of chlorine fed to the water supply is done by four heavy-duty platform scales, each with a capacity of 22,500 pounds, more than enough to carry five filled chlorine tanks of 3,400 pounds gross weight each.

The scale dials are of 10,000 pounds capacity, permitting a dial reading for the complete discharge of five tanks. Special 8 x 8-foot platforms were just right to take three tanks, with two more in the second tier. The double-check feature, a remote indication in the Superintendent's office showing the flow of chlorine, is accomplished by a graphic recorder. As the chlorine is discharged from the cylinders on the scales into the water supply, four graphic recorders simultaneously chart an exact and continuous reproduction of the feeding operation for each scale, for every minute of the day or night, on a panel board in the Superintendent's office.

In Minneapolis they wanted the scale platforms in the basement, with the scale dial and cabinets on the floor above. In Detroit it was necessary to supply graphic recorders attached directly to a special scale dial that gave clockwise and anti-clockwise reading facilities. In Knoxville, engineers supplied portable scales for measuring the discharge from small cylinders, placed two or four at a time on the scale platform, and equipped the scales with graphic recorders.

All these installations were made by engineers of the Toledo Scale Co., Toledo, Ohio.



THE SCALES, CONTROL PANEL AND CHLORINE CYLINDERS AT THE MONTREAL WATER WORKS

HAZARD ARMORTITE CABLE

(Non-Metallic Armored)

Underground lighting systems add greatly to the appearance of suburban streets. Hazard Armortite Cable is ideal for this purpose. Armortite is buried directly in the ground without conduits as it is protected against moisture and mechanical injury by plastic sealing compound, asphalted jute coverings and non-metallic tape armor. These materials are not affected by burial in soil. Investigate Armortite before buying any underground cable.

Sales Offices:
New York Chicago Philadelphia
Atlanta Seattle Dallas
Pittsburgh Buffalo Boston
San Francisco Los Angeles
Detroit Washington

HAZARD INSULATED WIRE WORKS

Division Of THE OKONITE COMPANY
WORKS: WILKES-BARRE, PA.

PARSONS *Snow Plows*

Embody latest scientific formation for streamline movement of snow. Greater speed, less power consumed, more snow moved. Built in four sizes and styles for large or small trucks.

— One-Way Plows
— Vee plows
— Wings

Hand, hydraulic or power hydraulic controls. There is a Parsons Representative near you.

Write —

THE PARSONS COMPANY

NEWTON *(Mention The American City)* IOWA

DO YOU KNOW

that LITHOPRINTS are—

Ink reproductions made by direct contact from tracings and can be had on practically any material.

As permanent as this printed page because they cannot fade.

True to scale because they go through no water bath.

The most economical method of reproducing tracings and drawings on tracing cloth.

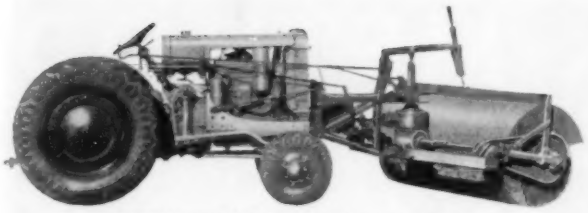
Comparable with a blueprint in price when printed on paper and white cloth.

AND that LITHOPRINTS are used by — City Engineers, County Engineers, City Assessors, Water and Sewer Departments, State Departments, Civil Engineers and Surveyors

Write for further information

LITHOPRINT CO. OF NEW YORK, INC.

41-43 Warren Street, New York City



THE NEW HOUGH TU-WAY SWEEPER

Tractor Sweepers for Snow-Removal

The Frank G. Hough Co., 919 North Michigan Avenue, Chicago, Ill., now has in production a new Tu-Way tractor sweeper. These machines have been in use for years for snow sweeping by municipalities, parks, cemeteries and large industrial plants. The new model incorporates many improvements and refinements, such as ball and roller bearings, full-enclosed gear boxes, and the exclusive two-direction brush which permits sweeping either to the right or to the left.

Autocar Business Increases in 1936

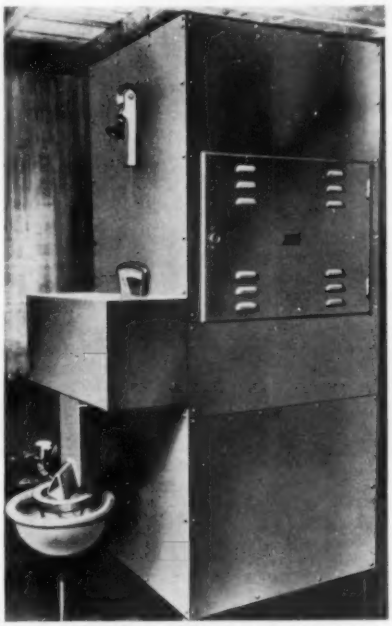
According to latest reports of the Autocar Co., Ardmore, Pa., business is booming, and it is anticipated that the last quarter of 1936 will be the best of the year and that the year will be the best that the company has experienced in some time. The latest large order has come from the Philadelphia Rapid Transit Co. for ten four-wheel-drive Autocar trucks to be used for snow-plow work. Each of the trucks is being equipped with a model 10F snow-plow and a center plow, located between the front and rear wheels of the truck. The plows are being manufactured by the Good Roads Machinery Corporation, Kennett Square, Pa.

New Weigh Feeder for Water Works Dry Chemicals

To accurately dose water with dry chemicals by weight, the Syntron Company, 400 North Lexington Avenue, Pittsburgh, Pa., has developed a new line of continuous, batch-weighing feeder machines, which weigh out the desired amount of material in batches and dump or discharge them every 15 seconds. The machine consists of a supply hopper equipped with a noiseless electric vibrator which prevents any arching-over or clogging-up of materials. The vibratory feeder flows the chemical from the supply hopper to a weigh hopper mounted on an accurate even balance type scale. This scale is equipped with electric controls that stop the vibratory feeder when exactly the right amount of material has been fed into the weigh hopper on the scale. An electric control dumps the contents of the weigh hopper every 15 seconds into the solution pot.

The capacity of the Model WMO-25 machine is from ⅛-ounce batches to 1-pound batches per discharge. It is also made in larger sizes. The rate of discharges can be set to dump by electric-clock control, from one to four times per minute as desired. Materials which have been successfully handled by this machine include activated carbon, hydrated lime, soda ash, alum and small lump lime.

All surfaces in contact with the chemicals are of stainless steel. The machine



THE NEW SYNTRON WEIGH FEEDER FOR WATER-WORKS CHEMICALS

is completely enclosed in a dust-tight cabinet with only the dial of the scale exposed. Material is dumped into the machine through a dust-sealed chute from the floor above.

Corning Acquires Macbeth-Evans

Corning Glass Works, Corning, N. Y., the world's largest maker of technical glassware, has acquired the Macbeth-Evans Glass Co., of Pittsburgh, Pa., according to a joint statement by officers of the two companies. The action has been approved by the Board of Directors, and ratification by the stockholders should be completed in time to permit operation on the new basis on January 1, 1937. The two manufacturing plants of the Macbeth-Evans Glass Co., located at Charleroi, Pa., and Elwood, Ind., will be operated as divisions of the Corning Glass Works.

The current production in the two factories of the Macbeth-Evans Glass Co. will effectively supplement the production at the Corning Glass Works carried forward in its present six factories. In general, policies of production and personnel of the Macbeth-Evans unit will be continued precisely as heretofore, according to Amory Houghton, President of Corning Glass Works.

The Macbeth company is recognized as one of the leading manufacturers of standard and special glass for lighting purposes, including glass shades, reflectors, and street lights. The acquisition of this company by Corning Glass Works is of particular interest, since it permits the expansion of the constantly growing business of Corning Glass Works in its many fields of specialized glass manufacture.

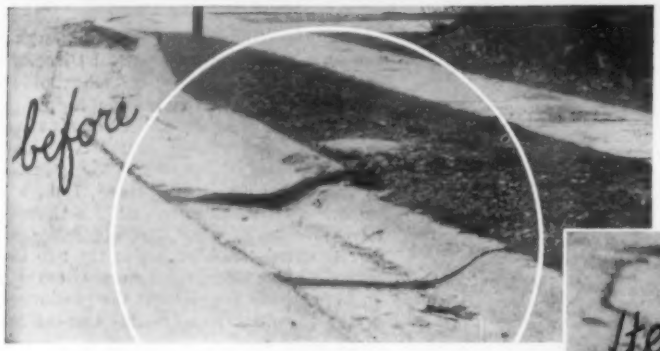
New Producer of Activated Carbon

Wishnick-Tumpeer, Inc., 295 Madison Avenue, New York, and with branches in principal centers through the country, has announced the addition of activated carbon to the Witco line. The company, which is a well-known supplier of chemicals, colors and pigments, reports favorable acceptance for its activated carbon in the field of water purification, to which sales efforts are being directed.

THE LATEST ADDITION TO THE FLEET OF COLLECTION TRUCKS USED BY THE INCINERATOR DIVISION, DEPARTMENT OF PUBLIC WORKS, PROVIDENCE, R. I.

These General Motors trucks are equipped with steel watertight dump-bodies by the Providence Body Co., Providence, R. I.

MUD-JACK METHOD
for raising concrete curb · gutter · walks · street



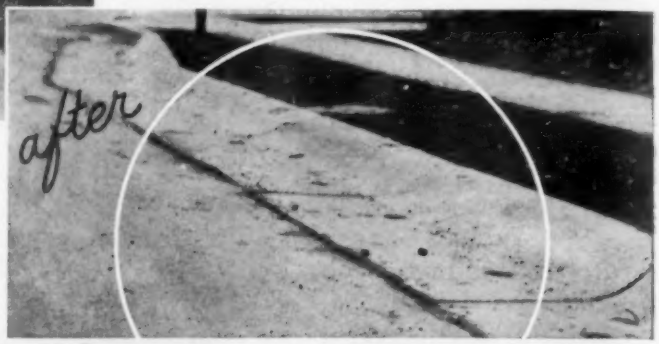
Sunken Curb and Gutter Marked for Reconstruction

but

THE MUD-JACK METHOD *corrected the settlement and saved the reconstruction costs*

Save CURB — GUTTER WALKS — STREETS

The Mud-Jack method saves the slab —corrects the subgrade—eliminates pedestrian hazards. Write for data to reduce maintenance expense.



KOEHRING COMPANY

Pavers · Mixers · Shovels · Cranes · Draglines · Dumptors · Mud-Jacks

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KOEHRING K HEAVY DUTY

MORE SNOW

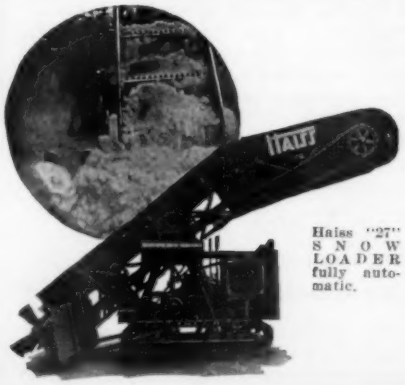
handling may come when there's a quick hard freeze. Here are tools to get the work done under the worst conditions—and get it done in a hurry. It's Haiss every time for heavy duty! We build 'em right!

For details and prices, write, wire or phone:

HAISS

George Haiss Manufacturing Co., Inc.
140th Street & Park Avenue, New York

This giant-bite SNO BUCKET has guts as well as speed—and you need both!



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A SMALL LEAKING PIPE BEFORE AND AFTER REPAIR WITH A DRESSER STYLE 57 SLEEVE

Quick Repairs for C. I. Pipe

Whether it is a split, a break or a hole in a cast iron water line, it is necessary to make a repair quickly and thoroughly. S. R. Dresser Manufacturing Co., Bradford, Pa., has developed the Style 57 sleeve, which bolts around the break quickly, and makes a flexible joint that absorbs stresses that might otherwise cause repeated failure, and is tight.

The single unit sleeves are made to completely enclose and pack off a section of pipe 8 inches long. Each sleeve is shipped complete with gaskets, bolts, and a socket wrench to facilitate tightening the side bolts. Multiple units are used to enclose more than 8 inches of pipe, as in the case of an uneven circumferential break or a long split. The gaskets, which are closely confined at the sides and ends, are high-grade rubber, insuring a continuous seal for years to come. They are held by a stuffing-box at each end and a grooved side pack to prevent blowing out when the sleeve is installed under pressure.

The Style 57 split repair sleeve is made to be used on lines operating on pressures up to 250 pounds per square inch and for pipe sizes of 2-, 3-, 4-, 6-, 8-, 10- and 12-inch for A.G.A. or A.W.W.A., Classes A, B, C, D.

Byers Announces Promotions

A. M. Byers Co., Pittsburgh, Pa., manufacturers of genuine wrought iron and tubular and flat rolled products, has announced a number of appointments which became effective November 2, 1936. George B. Cushing has been appointed Manager of Sales Promotion. He came with A. M. Byers Co. in 1928 to organize and head the present Advertising Department, and in 1931 he organized a technical promotion group now known as the Engineering Service Department.

B. D. Landes, who has been in the technical group since its inception, has been appointed Manager of the Engineering Service Department.

T. C. Winans, who has been in the Advertising Department since 1930, has been appointed Advertising Manager.

Both the Manager of the Engineering Sales Department and the Advertising Manager become a part of the newly formed sales promotion group headed by Mr. Cushing.

R. H. Gardner, formerly of the Washington office of A. M. Byers Co., has been appointed Manager of Pipe Sales and will take over all sales management duties in connection with wrought iron and steel tubular products.

New Traffic-Signal Controller

A complete, new simplified traffic-signal controller, designated as Novalux

THE NEW G-E NOVALUX TRAFFIC TIMER

Type D, has been announced by the General Electric Co., Schenectady, N. Y. This new controller is smaller and simpler in design than previous types, yet it is said to handle at least 75 per cent of traffic-control problems. It comprises a precision Telechron motor, a rotating dial, a drum with the necessary signal contacts, a panel with three snap switches, and an integral base casting. Traffic-cycle length can be varied from 40 to 180 seconds by means of gear changes within the timer. Five gear changes are provided with each unit, and as many as 16 cycle positions and as many as 15 signal-light circuits can be controlled.

A timer drum opens and closes the signal circuits, and cams actuate the tempered-steel riders, on which are silver electric contacts, capable of carrying a full 10-ampere lamp load. Bronze reduction gears that produce a final drive speed of 2 rpm are totally enclosed and run in a bath of oil which lasts the life of the unit. For accurate timing, a synchronous clock motor is used, requiring only 6 watts to operate. With this motor, adjacent intersections can be timed for progressive movement, and each timer will stay in step with every other unit. Any one of the timers in the system can be arranged to operate as the master for the entire system in addition to controlling an intersection.

Gascoigne Reorganizes—Opens New York Office

George B. Gascoigne, consulting sanitary engineer, Cleveland, Ohio, has announced the formation of George B. Gascoigne & Associates and the opening of consulting sanitary engineering offices in the Woolworth Building, New York City, under the management of Charles A. Emerson, Jr. The New York office will be operated as an adjunct to and in cooperation with the Cleveland office, which continues in the Leader Building.

(*Continued on page* 119)

AUTOCAR 165-INCH WHEELBASE TRUCK WITH 4-YARD DUMP-BODY AND SARGENT V-TYPE SNOW-PLOW WITH SIDE WINGS, OPENING ROADS IN VICINITY OF YORK BEACH, MAINE

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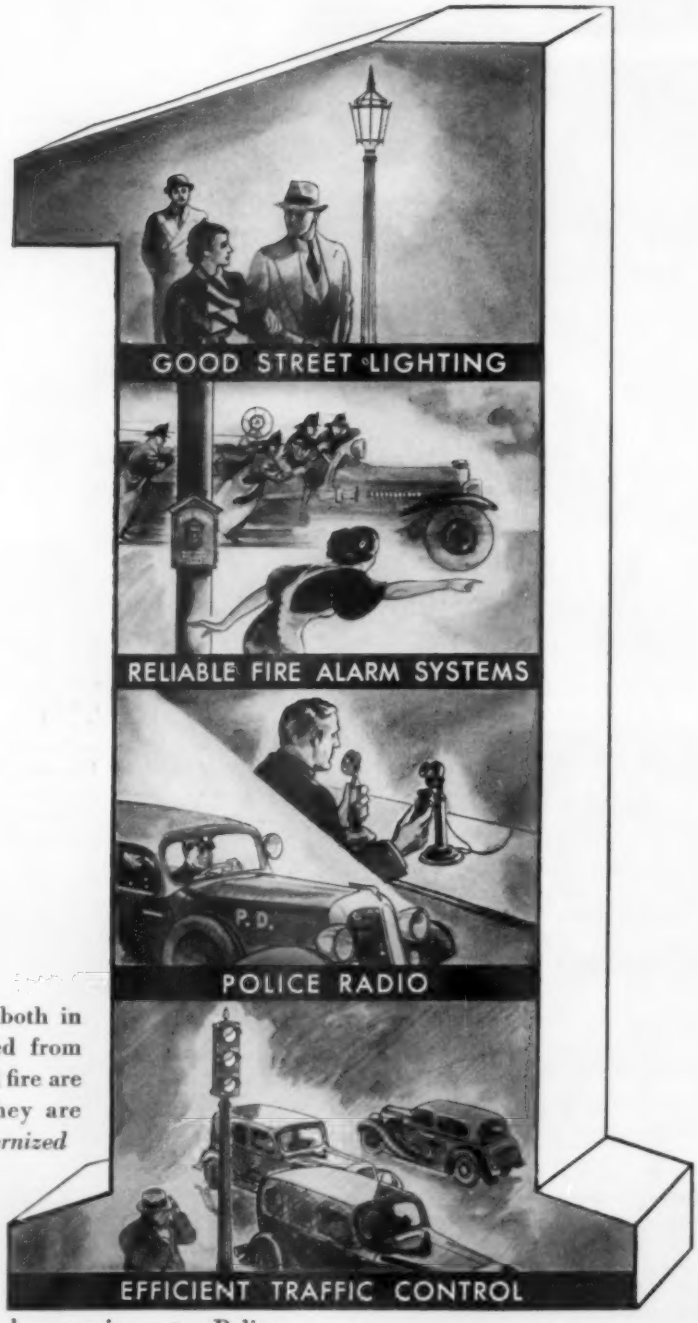

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The organization will engage in the practice of sanitary engineering, with particular emphasis on water supply and purification, sewerage and sewage treatment, industrial wastes treatment, garbage collection and disposal, valuations and rate investigations.

George B. Gascoigne is a graduate of Ohio State University, and for a period of ten years he was in the employ of the city of Cleveland on the development of its sewerage and sewage-treatment program. About fifteen years ago he established offices in Cleveland for private practice, and during this period he has had responsible association with about 150 municipalities and has continued with the development of the Cleveland sewage-treatment program.

Charles A. Emerson, Jr., is a graduate of Beloit College and Massachusetts Institute of Technology. He was associated with the city of Columbus in its water-works and sewerage-improvement program, and with the city of Baltimore in its sewage-treatment program, and for about ten years was Chief Engineer in the Pennsylvania State Department of Health. For the past fourteen years he has been associated with Fuller & McClintock, consulting engineers, first in charge of their Philadelphia office and latterly in the New York office.

Other associates with the organization are W. L. Havens, H. H. Burger, F. C. Tolles and F. W. Jones.

Ornamental Floodlights for City Streets

An ornamental lantern-type floodlight which appears to the casual observer to be merely an ornamental street light but which in reality is a floodlight for the illumination of buildings and monuments has been developed by Crouse-Hinds Co., Syracuse, N. Y. The daytime appearance is that of an ornamental street lantern. At night the large, efficient reflector on the inside transforms it into a powerful floodlight.

This type GCP-14 lantern floodlight provides a wide and uniform beam of light. The reflector first concentrates the light so that it all passes through one glass panel, and then spreads it. This prevents any light from being absorbed by the ribs of the lantern, as might be the case with an ordinary reflector.

The lantern is made in three types. Form A is used for lighting buildings or other objects where the beam is directed above the horizontal. Sufficient light is reflected below the horizontal with this type to illuminate the lower portion of buildings. This type is equipped with a heat-resisting top canopy. A horizontal adjustment of 45 degrees is provided so that the beam can be turned to strike the building at any angle, and still have one side of the lantern parallel with the building.

The Form B lantern is furnished with one side panel of heat-resisting glass, through which the beam passes, and the horizontal adjustment of the reflector is locked. This type is intended for lighting ground areas and low buildings. The Form C lantern has a narrow beam reflector for lighting high buildings or for other longer-range projection.

THE CROUSE-HINDS LANTERN-TYPE FLOODLIGHT

Motor Truck Committee of Automobile Manufacturers Association

Alvan Macauley, President of the Automobile Manufacturers Association, has announced the appointment of William F. McAfee, Motor Truck Sales Manager of International Harvester Co., as Chairman of the Motor Truck Committee, to succeed the late Alfred J. Brosseau. New members appointed to the Committee are W. E. Fish, Manager, Commercial Car Division, Chevrolet Motor Co., and David C. Fenner, Vice-President of Mack-International Motor Truck Corporation.

A 24 per cent increase in the sales of motor trucks over last year was reported to the Committee at its meeting at the Association's New York headquarters last month. Based on returns for the first ten months, it is estimated that 680,000 motor trucks will have been purchased in the United States by the end of the year.

Other members of the Committee are Irving B. Babcock, President, General Motors Truck Corporation; Robert F. Black, President, The White Motor Co.: Joseph D. Burke, Director of Truck Sales, Chrysler Corporation; Robert P. Page, Jr., The Autocar Co.; Elijah G. Poxson, President, Reo Sales Corporation; Martin L. Pulcher, President, Federal Motor Truck Co.; Arthur C. Butler, Secretary of the Committee.

New Research Assistant for Activated Alum Corporation

A. C. Brumley, graduate in chemistry and economics from Yale University in 1936, has joined the Research Department of the Activated Alum Corporation, New York City, to assist in the development work now being conducted in the interest of better water supplies.

Concrete Convention and Equipment Show

The National Concrete Masonry Association, National Conference of Concrete Contractors, The Cast Stone Institute, The American Concrete Pipe Association and the National Cinder Concrete Products Association are holding a joint convention in the Sherman Hotel, Chicago, Ill., January 18, 19 and 20, 1937. In conjunction with these conventions there will be a Concrete Industry Exposition of concrete equipment, accessories and supplies, including concrete mixers, block manufacturing machinery, special form systems, form clamps and many other interesting displays.

Eugene F. Olsen, Stearns Manufacturing Co., is Chairman of the Exhibitors Advisory Board of the Concrete Industries Exposition. Assisting him on the Board are: Jesse H. Besser, Besser Manufacturing Co.; Louis Brookman, Jr., Concrete Publishing Corporation; J. H. Chubb, Pennsylvania-Dixie Cement Corporation; D. S. Colburn, Marquette Cement Manufacturing Co.; B. F. Devine, Chain Belt Co.; Lion Gardiner, The Jaeger Machine Co.; Robert Harris, Blaw-Knox Co.; A. E. Hjerpe, Consolidated Cement Corporation; D. S. MacBride, International Cement Corporation; D. H. MacFarland, Medusa Portland Cement Co., Roy N. McCandless, Cinder Block, Inc.; Frank Muenzer, Multiplex Concrete Machinery Co.; Thomas W. Noble, Thos. W. Noble Co.; H. H. Potts, Pottsco Corporation; B. H. Rader, Lehigh Portland Cement Co.; T. A. Rehnquist, T. A. Rehnquist Concrete Floor Co.; Dan F. Servey, Haydite Corporation; J. L. Shiely, J. L. Shiely Co.; Blaine S. Smith, Universal Atlas Cement Co.; H. F. Thomson, General Material Co.; Stanton Walker, National Ready Mixed Concrete Association; and Benjamin Wilk, Standard Building Products Co.

Olson Joins Standex

Vincent Harris Olson, formerly Vice-President and General Manager of the American Waterproofing Corporation, and later General Manager of the Queen City Varnish Co., a subsidiary of the National Printing Ink Corporation, has just become General Manager of the Standex Corporation, Los Angeles, Calif. Mr. Olson is an authority on the waterproofing of mass concrete type construction and technical paint products.

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Two Cities Cooperate in Lighting Connecting Highway

By G. SODERBERG
Engineer, City of Akron, Ohio

THE city of Akron and the city of Cuyahoga Falls recently collaborated in the production of a scientifically lighted new one-way highway on Route 5, connecting the cities over a remodeled street-car bridge. The new lighting is the first of its kind in Ohio in four respects, as contained in the list:

1. First sodium-vapor highway lighting.
2. First use of sodium-vapor lamps and incandescent lamps on the same stretch.
3. First bridge to be lighted with sodium-vapor lamps.
4. First time that two municipalities cooperated to put in new, modern lighting on a connecting highway.

Of the seventeen lighting units used, ten are similar to the luminaires installed last year by the General Electric Co. in its strip of demonstration highway lighting on Route 422, east of Chagrin Falls, and discussed in THE AMERICAN CITY last December. This luminaire, using a new type 4,000-lumen bar-filament lamp, has a scientifically designed reflector which provides "high visibility" safety lighting to the two-lane roadway.

Five of the remaining units are the newest type sodium. These 10,000-lumen lamps are particularly suited to meet conditions where the existing poles are placed far apart. They are used to illuminate the way over the bridge. Despite the yellow light emitted by the new lamps, scientific investigation has definitely proved that this light actually enables one to see objects more distinctly. Moreover, experience has proved that motorists, when they note the contrast between the yellow of the sodium-lit section and the white light of the incandescent lamps, interpret the change as a warning, and exercise greater care in driving.

The two remaining units are used to produce a floodlighting effect on the south end of the new highway, which is a dangerous intersection. These luminaires use the regular 4,000-lumen incandescent series street lamps and are practically glare-free.

Cuyahoga Falls owns its street-lighting system; Akron's is owned and operated by the Ohio Edison Co.

AKRON AND CUYAHOGA FALLS, OHIO, BUY HIGH VISIBILITY
Foreground lighted by 4,000-lumen bar-filament lamps; in the distance are the 10,000-lumen sodium-filament lamps; at the left are units of an inadequate system on a companion branch of the highway

General Electric Announces

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GENERAL ELECTRIC

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Increasing Number of Examples of Good Lighting

See Also Page 121 of This Issue

Five Miles Near Schenectady, N. Y.

FOR more than 5 miles along the Balltown road near Schenectady, 231 4,000-lumen bar-filament lamps spaced 125 feet apart light the way.

BAR FILAMENTS ON BALLTOWN ROAD

Safe for 1½ Miles

THE second of Ohio's 48 educational highways, announced here last month, was opened November 11 on Route 25, the Dixie Highway, south of Dayton. Lighting is by sixty-six luminaires: 4,000-lumen, 6.6-ampere, bar-filament medium bi-post street series lamps along the 1½-mile stretch. The poles are spaced 125 feet apart. New signs instruct the motorist to check brakes, depress headlights when meeting other cars, and keep to the right; others advise pedestrians to face traffic.

MODEL STRETCH NEAR DAYTON

Sodium Lighting in Peru

THE concrete highway from Lima to Callao, Peru, has just been equipped with 140 10,000-lumen General Electric sodium luminaires, replacing early parabolic nested units.

SODIUM-LIGHTED INTERSECTIONS AT NORTHBROOK, ILL. (LEFT) AND ENDICOTT-JOHNSON CITY ROAD, N. Y.

Safety Council Sponsors Lighting at Northbrook, Ill.

A MILE of Skokie Highway at Northbrook, Ill., near Chicago, was recently equipped with 26 sodium-vapor luminaires, under the sponsorship of the Chicago Safety Council. Manager George C. Traver said that the Council recognized the lack of attention given to adequate street and highway lighting as a potential factor in the accident problem.

New Light at Middletown, Conn.

MOTORISTS leaving the white way of Main Street, Middletown, Conn., are now guided for half a mile on the new extension of that street by 14 vapor 10,000-lumen sodium lamps spaced 250 feet apart on Union Metal poles.

Light Roads in Town Centers

IN the country the only practicable walkway for pedestrians is the roadway used by automobile traffic. It is not economically practicable to provide illumination for every foot of roadway frequented by pedestrians; however, it is recommended that lighting be provided in town centers or congregating areas, although there may be sidewalks. In the latter case pedestrians crossing the roadway is the primary hazard. Where adequate illumination is provided, the pedestrian and the motorist can see each other and thus avoid an accident. Lighting may be beneficially extended from the congregating center to take in as much of the built-up town area as may be economically practicable.

ELLSWORTH FRANCISCO,
Bureau of Lighting, Newark, N. J.; before the National Safety Congress.

Endicott to Johnson City, N. Y.

FOUR miles of sodium lamps now light the four-lane George F. Johnson Highway between the two industrial centers, Endicott and Johnson City, near Binghamton, N. Y.

Minnesota Lighting Highways

THIRTY-FOUR sodium lamps have been placed in operation at intersections on Route 7 between Excelsior and Minneapolis, and the Minnesota Highway Department is making a second installation on a mile stretch near Bemidji.

Better Lamps in Wichita

WICHITA, KANS., has installed on Central Avenue 14 Acorn street lamps which eliminate glare in the eyes of motorists and put twice as much light on the street as former types of conventional units.

Commenting on the new lighting installation, the Wichita Chamber of Commerce magazine said: "Because of its high accident rate, this stretch was chosen for an interesting and important experiment, sponsored by the Public Safety Committee with the cooperation of the Police Department and the Kansas Gas and Electric Co., in reducing accidents through better lighting.

"Records show that the greatest number of traffic accidents occur between the hours of dusk and dawn, and with greatest frequency where pedestrian and vehicular traffic are intermixed. Under this experimental plan, there are more lights, of high intensity and a type of reflector that directs the illumination where it is needed. This experiment is in line with the most recent trend of safety engineering, and the outcome will be watched with great interest."

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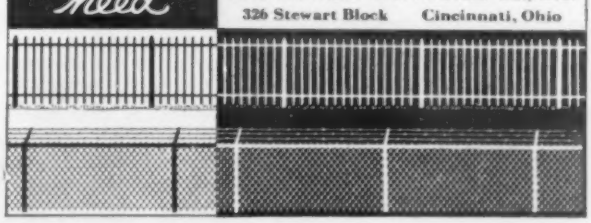

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The Municipal Index

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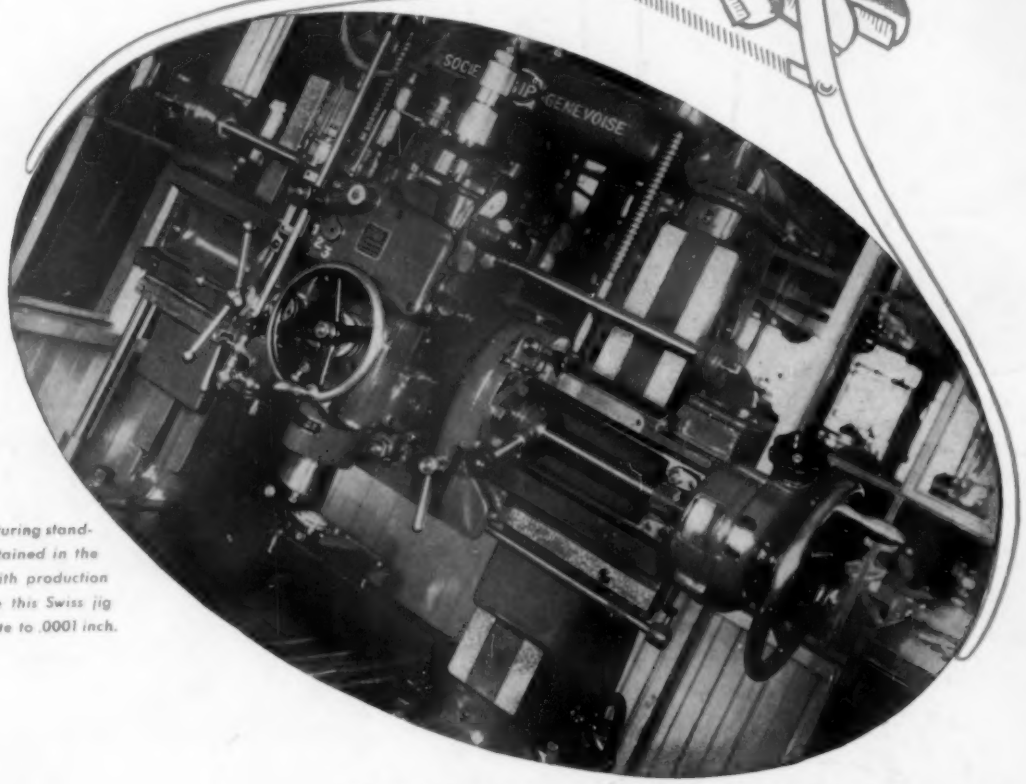

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Tomorrow's taxpayers will be uniform in praising today's selection of W&T Visible Vacuum Chlorinators.

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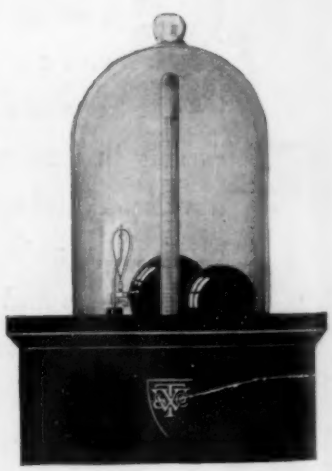

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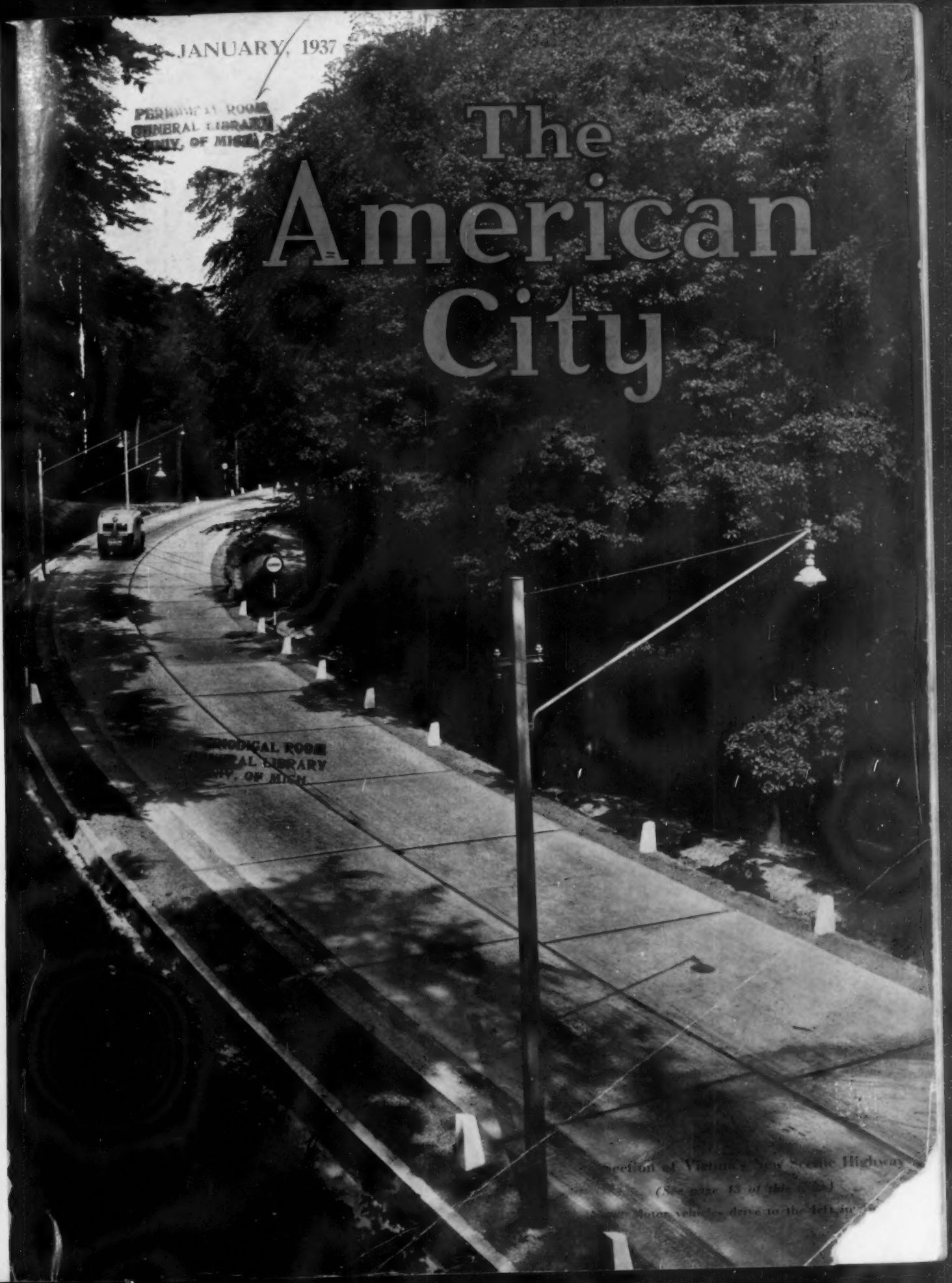

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